

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BMW OF NORTH AMERICA, LLC,

Petitioner,

v.

NORTHSTAR SYSTEMS, LLC,

Patent Owner.

Case No. IPR2023-01191

U.S. Patent No. 8,805,416

PETITION FOR *INTER PARTES* REVIEW

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LIST OF EXHIBITS

Exhibit	Description
Ex. 1001	U.S. Patent No. 8,805,416 (“the ’416 patent”)
Ex. 1002	File History of U.S. Patent No. 8,805,416
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Ex. 1004	Curriculum Vitae of Sam Pullen, PhD
Ex. 1005	U.S. Patent No. 6,195,022 to Yamakita (“Yamakita”)
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Ex. 1007	U.S. Patent No. 6,427,120 to Garin et al. (“Garin”)
Ex. 1008	U.S. Patent Application Publication No. 2003/0060211 to Chern et al. (“Chern”)
Ex. 1009	U.S. Patent No. 7,822,635 to Brown et al. (“Brown”)
Ex. 1010	U.S. Patent No. 6,226,589 to Maeda et al. (“Maeda”)
Ex. 1011	WIPO Publication No. WO2000/22593 to Drury et al. (“Drury”)
Ex. 1012	WIPO Publication No. WO2000/03364 to Obradovich et al. (“Obradovich”)
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Ex. 1014	File History of U.S. Patent Application No. 09/690,001 (’001 application)
Ex. 1015	Comparison of the ’416 patent and the ’001 application
Ex. 1016	File History of U.S. Patent Application No. 09/682,600
Ex. 1017	U.S. Patent No. 6,522,888 to Garceran et al. (“Garceran”)
Ex. 1018	U.S. Patent No. 6,115,611 to Kimoto et al. (“Kimoto”)

Exhibit	Description
Ex. 1019	Ian D. Kitching, “GPS and Cellular Radio Measurement Integration,” <i>Journal of Navigation</i> , Vol. 53, No. 3, September 2000, pp. 451-463. (Available at https://www.cambridge.org/core/journals/journal-of-navigation/article/abs/gps-and-cellular-radio-measurement-integration/C563A3AE053461124A4127E6B9B2DD13). (“Kitching”)
Ex. 1020	Goran M. Djuknic and Robert E. Richton, “Geolocation and Assisted GPS,” <i>Computer (IEEE)</i> , Vol. 34, No. 2, February 2001, pp. 123-125. (Available at https://doi.org/10.1109/2.901174). (“Djuknic”)
Ex. 1021	Complaint in <i>NorthStar Systems LLC v. Bayerische Motoren Werke AG</i> , 2:22-cv-00496 (EDTX).
Ex. 1022	Infringement contentions in <i>NorthStar Systems LLC v. Bayerische Motoren Werke AG</i> , 2:22-cv-00496 (EDTX).

I. Relief Requested

BMW of North America, LLC (Petitioner) requests *inter partes* review of claims 1, 2, 7, 8, 11, 14, 16, and 20-35 of U.S. Patent No. 8,805,416 (“the ’416 patent”) based on the following grounds:

Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)
1	1, 2, 7, 8, 11, 14, 16, and 24-29	103	Chern and Garceran
2	11 and 15	103	Chern and Garin
3	20-23 and 30-35	103	Yamakita

II. The ’416 Patent

A. Overview

The ’416 patent relates to location-based services, including “navigation assistance” systems and methods that use “positioning” information to inform the navigation. Ex. 1001, 4:35-51, 4:62-64, 5:4-5, 5:63-6:15; Decl. ¶ 43.

The positioning information includes information “obtained from GPS satellites,” “a Bluetooth transponder,” “information about the different base stations or receivers/transmitters which are communicating with the client” and/or other “environmental information.” Ex. 1001, 4:35-51, 4:62-64, 5:4-5, 5:63-6:15. A “thin client”—such as a “cell phone”—detects and transmits the positioning information to a base station and server, which uses the information to provide the

thin client with navigation information. Ex. 1001, 1:26-35, 4:33-42, 4:59-64, 5:60-62, 6:1-3, 6:11-15, 7:21-29; Decl. ¶ 44.

B. The '416 Patent Is Not Entitled to Priority Earlier than September 25, 2001

The '416 patent, filed February 14, 2008, is a divisional of U.S. application Ser. No. 09/682,600 filed September 25, 2001, which is a continuation-in-part (CIP) of U.S. application Ser. No. 09/690,001, filed October 16, 2000. The '416 patent is not entitled to a priority date earlier than September 25, 2001.

There is no presumption that the '416 patent is entitled to the effective filing date of the '001 application because it is a CIP. *PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1305 (Fed. Cir. 2008). While Patent Owner bears the burden of proving priority, (*id.*), Petitioner nonetheless submits that the '416 patent claims are not entitled to priority to the '001 application because that application neither disclosed nor claimed, *inter alia*:

- detecting, sending, or receiving signal interference/an indication of interference, as recited in independent claims 1, 11, 24, and 25; or
- detecting, sending, or receiving environmental information, as recited in independent claims 20 and 30; or
- receiving, generating, or transmitting mapping/navigation information associated with, based on, or in response to the signal

interference/indication of signal interference, or environmental information. *See generally* Ex. 1001; Ex. 1014, 230-45; Ex. 1015.

Any possible support for these limitations was first added to the specification of the CIP application Ser. No. 09/682,600 filed September 25, 2001. Ex. 1015; Decl. ¶¶ 47-55. Thus, the earliest possible priority is to September 25, 2001.

III. Claim Construction

Claim 30 recites a “means for” determining, wirelessly communicating, and displaying. Ex. 1001, claim 30. These limitations are presumed to invoke 35 U.S.C. § 112(f). *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015) (en banc). Dependent claims 32-35 recite additional “means for” limitations which also presumably invoke § 112(f). Petitioner therefore identifies, for each “means,” “specific portions of the specification that describe the structure, material, or acts corresponding to each claimed function” in accordance with 37 C.F.R. § 42.104(b)(3).

Whether Petitioner identifies a structure compliant with 37 C.F.R. § 42.104(b)(3) is a separate inquiry from whether the identified structure is sufficiently definite, and Petitioner reserves the right to assert that the claims are alternatively indefinite. *Zillow Grp., Inc. v. Int’l Bus. Machs. Corp.*, IPR2020-01656, Paper 8 at 11 (PTAB Mar. 15, 2021) (“Patent Owner cites no

authority nor are we aware of any authority for the proposition that we may not assess the patentability of claims in an *inter partes* review because the Petitioner also challenges those claims as indefinite in District Court.”); *Target Corp. v. Proxicom Wireless, LLC*, IPR2020-00931, Paper 10 at 9 (PTAB Nov. 10, 2020) (noting that “[a]lternative pleading before a court is common practice”); *Alcon Inc. v. AMO Dev., LLC*, IPR2021-00843, Paper 15 at 15-16 (PTAB Nov. 12, 2021) (instituting review despite petitioner’s allegation before the district court that the claim is indefinite when the Board was “able to construe the disputed claim term with sufficient precision to address the obviousness arguments”).

Petitioner identifies the following specific functions and structures corresponding to the means terms:

[30a]: “means for determining a current location of the apparatus;”	Function: “determining a current location of the apparatus” Structure: “[P]rocessor 110 which processes signals from ... GPS device 115.” Ex. 1001, 1:19-25.
[30b]: “means for displaying navigation instructions;”	Function: “displaying navigation instructions” Structure: A display screen 502. Ex. 1001, 3:51-53, FIG. 5.
[30c]: “means for wirelessly communicating information about the current location to a remote processing device,”	Function: “wirelessly communicating information about the current location to a remote processing device” Structure: An “antenna” and “receivers/ transmitters” for communicating (sending and/or

	receiving) information. Ex. 1001, 3:48-51, 6:5-9.
[30e]: “means for wirelessly receiving the navigation instructions associated with the current location ¹ ...”	Function: “wirelessly receiving the navigation instructions associated with the current location” Structure: An “antenna” and “receivers/transmitters” for communicating (sending and/or receiving) information. Ex. 1001, 3:48-51, 6:5-9.
Claim 32: “means for acquiring the [G]PS information”	Function: “acquiring the [G]PS information” Structure: A “GPS device” or “GPS computer.” Ex. 1001, 1:16-18, 3:17-19, 4:33-36 (describing a “GPS device” or “GPS computer” for determining a thin client’s current location).
Claim 33: “means for acquiring the environmental information”	Function: “acquiring the environmental information” Structure: A camera or microphone. Ex. 1001, 6:11-16 (describing a camera and microphone for receiving images and sound environmental information).

Decl. ¶ 60.

¹ The ’416 patent does not distinguish between means for communicating information (about current location) and means for receiving information (navigation instructions). Decl. p. 25, n1.

No other terms need to be construed to resolve unpatentability. *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019).

IV. Level of Ordinary Skill

A person of ordinary skill in the art (“POSITA”) at the time of the purported invention would have had at least a bachelor’s degree in Computer or Electrical Engineering or an equivalent engineering discipline, and approximately three years of experience in navigation or geolocation systems alongside a background in telecommunications. Additional education could substitute for professional experience, and significant work experience could substitute for formal education. Decl. ¶ 63.

V. Ground 1: Claims 1, 2, 7, 8, 11, 14, 16, and 24-29 Are Obvious over Chern and Garceran.

A. Overview of the Prior Art

1. Chern

Chern, filed August 27, 1999, is prior art under at least 35 U.S.C. § 102(e). Chern discloses a wireless location-based information retrieval system having navigation applications. Chern, Abstract, [0044]. The system includes a wireless handset having an incorporated “position determination system” for determining the handset’s location using GPS or “[a]lternative position determination systems.” Chern, [0040]. The system also includes a server which communicates with the

handset over a wireless network. Chern, [0043]. The system provides “driving directions to a destination address ... to a handset user.” Chern, [0044].

Chern discloses detecting additional information that would improve the accuracy of its position determination system, including detecting handset “height, speed of travel, and any other useful location or position parameters” and sending both the GPS and additional information to a server via a wireless network comprised of base stations. Chern, [0040], [0043]-[0044].

2. Garceran

Garceran, filed August 31, 1999, is prior art under at least 35 U.S.C. § 102(e). Garceran teaches “a wireless communications system” that “determines and/or receives location information for the wireless unit along with other information associated with the location information.” Garceran, 2:12-15

Like Chern, “wireless unit 70 includes GPS receiver circuitry 72 which receives GPS signals from a duplexer 74 which is connected to the antenna 76 of the wireless unit 70.” Garceran, 6:31-44. “[T]he GPS receiver circuitry 72 provides a location information which can include time, speed, distance and/or direction for the wireless unit to the processing circuitry 78 of the wireless unit 70.” Garceran, 6:39-44. And like Chern, Garceran’s communication communicates the GPS information with one or more base stations of a wireless network. Garceran, 6:59-62.

Because “[a] change in operating condition could trigger a dynamic change in the RF coverage provided by the serving base station(s) and/or neighboring base stations to the wireless unit(s) in the location or range of location[,]” the wireless unit also “determines,” the “operating conditions or parameters, such as time, weather, traffic load, path loss and/or interference level” (associated information) affecting communication between the mobile unit and base station. Garceran, 2:34-42, 6:31-44, 59-62. The handset then “transmit[s] the [GPS] location information and associated signal quality or other information,” an indication of the signal interference, “to a serving base station 54 (FIG. 2) over a channel on the reverse link.” Garceran, 2:39-42, 6:31-44, 59-62.

Chern and Garceran are analogous to the ’416 patent because they are directed to the same technical field: location-based services for wireless communication devices. *Compare* Ex. 1001, 4:34-51, 5:4-5, *with* Chern, Abstract, [0040], [0044], [0051]-[0053]; Garceran, Abstract, 1:8-11; Decl. ¶¶ 70, 75.

B. Claims

1. Independent claim 1

a. [1preamble]: “A method, comprising:”²

Chern discloses [1preamble] because Chern discloses “a location-based information retrieval system and method for wireless communication devices” and a method for requesting and receiving directions over a network. Chern, [0027], [0044]-[0054, FIG. 3; Decl. ¶ 87.

b. [1a]: “receiving, by a mobile communication device, information about a current location of the mobile communication device, wherein the information about the current location includes global positioning system (GPS) information;”

Chern discloses [1a] because Chern discloses receiving, at a “wireless handset,” a “user’s current location as determined by [a] position determination system” wherein the position determination system is “implemented using a GPS (global positioning system) or differential GPS.” Chern, [0040], [0045]. The handset includes “a GPS receiver 304 that functions as the position determination device” and a handset “[a]ntenna 310 allows GPS receiver 304 to communicate with the constellation of GPS satellite.” Chern, [0084]; Decl. ¶ 88.

² Petitioner does not concede the preamble is limiting. If Patent Owner argues it is, Chern discloses it.

- c. **[1b]-[1c]: “detecting, by the mobile communication device, signal interference; generating, by the mobile communication device, an indication of the signal interference;”**

Chern in combination with Garceran renders obvious [1b]-[1c]. Decl. ¶¶ 89-98.

Chern discloses detecting additional information that would improve the accuracy of its position determination system, including detecting handset “height, speed of travel, and any other useful location or position parameters” and sending both the GPS and additional information to a server via a wireless network comprised of base stations. Chern, [0040], [0043]-[0044]. Chern states that “a speed of travel parameter is provided by handset 130 along with the current position” to allow the server to determine whether it needs to “update the position information” for direction calculation purposes. Chern, [0054].

Although Chern discloses that “any other useful location or position parameters” can also be used to determine the handset’s location or position, Chern does not expressly disclose detecting signal interference or generating an indication of the signal interference. Chern, [0040]. But Garceran does.

Garceran teaches “a wireless communications system” that “determines and/or receives [GPS] location information for the wireless unit along with other information associated with the location information.” Garceran, 2:12-15, 6:39-44.

Like Chern, and as illustrated in Figure 4, Garceran's "wireless unit 70 includes GPS receiver circuitry 72 which receives GPS signals from a duplexer 74 which is connected to the antenna 76 of the wireless unit 70." Garceran, 6:31-44. "[T]he GPS receiver circuitry 72 provides a location information which can include time, speed, distance and/or direction for the wireless unit to the processing circuitry 78 of the wireless unit 70." Garceran, 6:39-44. And like Chern, Garceran's communication device is configured to communicate the GPS information to one or more base stations of a wireless network. Garceran, 6:59-62.

Because "[a] change in operating condition could trigger a dynamic change in the RF coverage provided by the serving base station(s) and/or neighboring base stations to the wireless unit(s) in the location or range of location" the wireless unit also (1) "determines" (detects) the "operating conditions or parameters, such as time, weather, traffic load, path loss and/or interference level" (associated information) affecting the communication signal and (2) "transmit[s] the [GPS] location information and associated signal quality or other information" i.e., a generated indication of the signal interference, "to a serving base station 54 (FIG. 2) over a channel on the reverse link." Garceran, 2:39-42, 6:31-44, 59-62 (emphasis added); Decl. ¶ 94.

This is consistent with the '416 patent, which does not use the term “generating an indication of signal interference” but does explain that “the client may also transmit local ‘raw’ information” including information about “power and/or type of cellular reception...interference from a...radio transmitter” or “cellular or other type[s] of information.” Ex. 1001, 5:42-6:10; Decl. ¶ 95. Thus, POSITA would have understood that a *transmission* conveying the signal interference information is a *generated* indication of the detected signal interference because the client (mobile communication device) generates the transmission, and the transmission indicates the nature of the signal interference. Decl. ¶ 95.

i. Motivation to Combine Garceran’s Detection of Signal Interference with Chern’s System

A POSITA would have understood the benefit of sending the associated signal quality (indication of interference) in addition to the GPS information to enhance position detection for navigation using a cellular phone because systems using cellular signal information to enhance position determination for navigation were known in the art. Decl. ¶ 96 (citing Kitching, 3, 7, 12- 13 (describing systems and methods for enhancing position detection in navigation applications “utilising both GPS and [base station (BS)] cellular measurements” and explaining that “[t]he combination of GPS and cellular technologies ... affords improved positioning capabilities over a range of operating environments that neither system

alone can achieve” and “improved transmitter geometry in areas where signal blockage may occur.”); *see also* Kitching, 9 (describing earlier systems “that combine GPS and cellular systems” to “give improved positioning performance.”); Djuknic, 1 (“assisted-GPS technology offers superior accuracy, availability, and coverage at a reasonable cost.”), 3 (explaining that “interference” has “noticeable effects” on “the accuracy of geolocation technologies” and using “Hybrid approaches that use multiple geolocation technologies appear to be the most robust solution to problems of accuracy and coverage ... AGPS provides a natural fit for hybrid solutions because it uses the wireless network to supply assistance data to GPS receivers in handsets” and listing additional advantages of combining base station and GPS location technologies (Assisted GPS or AGPS) for location-based services).

Thus, a POSITA would have been motivated and found it obvious to configure Chern’s handset to use multiple sources of position information, including an “associated signal quality or other information,” taught by Garceran, to improve location determination and the location-based services of Chern. Decl.

¶ 97. Such an improvement would have been especially useful where environmental conditions, e.g., weather or building structures, limit, block, or otherwise prevent the GPS receiver from acquiring information from the GPS satellite. Kitching, 9-13; Djuknic, 1-3; Decl. ¶ 97.

ii. Expectation of Success

A POSITA would have also had a reasonable expectation of success in configuring Chern’s handset to detect signal interference and generate an indication of the signal interference, as evidenced by Garceran, 6:31-44, 59-62, 15:6-12 (“the RF coverage system can be implemented ... in application specific integrated circuits, software-driven processing circuitry, firmware or other arrangements of discrete components as would be understood by one of ordinary skill in the art with the benefit of this disclosure.”); *see also* Chern, [0082] (explaining that location-based service methods “may be implemented as computer programs, software or hardware” and functions relating to handset “may be coded in processor 104 or could be stored in memory 114.”); Kitching, 9-13 (highlighting experimental results demonstrating the utility and benefits of combining GPS and base station position information, and further discussing system modifications that may be required to implement the modification); Djuknic, 1-2 (describing ways to implement the combined technologies); Decl. ¶ 98.

- d. [1d]: “communicating, by the mobile communication device, with a remote source over a wireless network, wherein said communicating comprises sending both the indication of the signal interference and the GPS information from the mobile communication device to the remote source;”**

Chern and Garceran render obvious [1d] because the combination teaches transmitting the GPS location information and associated signal quality or other

information to a base station over a wireless network. Garceran, 6:31-44, 59-62; Chern, [0043]-[0044]; Decl. ¶¶ 99-102.

As explained for [1b]-[1c], Garceran discloses transmitting (communicating) “the [GPS] location information and associated signal quality or other information” (an indication of the signal interference) “to a serving base station 54 (FIG. 2)[,]” a remote source, over a channel on the reverse link.” Garceran, 6:31-44, 59-62 (emphasis added).

Chern likewise discloses transmitting the handset’s “determined” location “to server 136 over wireless network 140” comprised of base stations. Chern, [0043]-[0044].

As explained for [1b]-[1c], a POSITA would have been motivated and found it obvious to transmit multiple sources of position information, including the GPS information and an “associated signal quality or other information” (indication of signal interference), as taught by Garceran, to improve location determination and the location-based services of Chern. *Kitching*, 9-13; *Djuknic*, 1-3; Decl. ¶ 101.

A POSITA would have had a reasonable expectation of success in sending both types of information to the server because doing so would have merely required using existing conventional components (Chern’s handset transceiver) for its intended conventional use (transmitting the handset’s determined location to the server). Chern, [0007], [0034], [0044]; Decl. ¶ 102.

- e. **[1e]: “receiving, by the mobile communication device, navigation information from the remote source in response to sending both the indication of the signal interference and the GPS information, wherein the navigation information comprises data for plotting a course on a map including the current location of the mobile communication device;”**

Chern in combination with Garceran renders obvious [1e] because the combination teaches receiving driving directions to a destination (navigation information) from the base station in response to sending the GPS location and associated signal quality (indication of signal interference) information. Garceran, 6:31-44, 59-62; Chern, [0043]-[0044]; Decl. ¶¶ 103-108.

As explained for [1d], Chern as modified by Garceran teaches sending the GPS information and an “associated signal quality or other information” (indication of signal interference) to a remote source. Garceran, 6:31-44, 59-62; Chern, [0043]-[0044].

Chern discloses transmitting from the server and receiving at the handset “driving directions to a destination address” (navigation information) based on the handset’s determined location. Chern, [0044]-[0054].

First, when “[t]he user requests driving directions to [a] destination ... the request is communicated to server 136 over wireless network 140” along with “the [determined] handset location ... to provide a starting point for the directions.”

Chern, [0044]. The determined handset location, as discussed for [1b], is based on GPS and an indication of signal interference, as taught by the combination.

Next, “[u]sing the handset location and the destination address” Chern’s server “calculates a route and compiles driving directions” to the “destination address.” Chern, [0044]. That is, Chern’s server generates a “route” and “driving directions” (navigation information comprising data for plotting a course on a map) from a “starting point” corresponding to the “determined” “handset location” (including the current location of the mobile communication device) to the destination.

Then, the driving directions (navigation information comprising data for plotting a course on a map) are received by “handset 130 over network 140 and are displayed or audibly rendered to the user” as “textual driving directions[and] a map showing the route.” Chern, [0044].

f. [1f]: “and displaying, by the mobile communication device, the map based on the navigation information.”

Chern in combination with Garceran renders obvious [1f] because Chern discloses displaying “a map showing the route” (navigation information) calculated and transmitted by the server “on the handset display.” Chern, [0044]. Decl. ¶ 109.

2. **Claim 2: “The method of claim 1, wherein the navigation information is associated with a direction of travel, and wherein the method comprises deleting or ignoring, by the mobile communication device, information that is not associated with the direction of travel.”**

The '416 patent does not disclose³ deleting or ignoring by the mobile communication device, information that is not associated with a direction of travel; but does disclose “continuously” changing or updating information “[a]s the unit moves” to reflect “a new batch of information, centered around the current location,” thus disregarding information associated with a previous location. Ex. 1001, 5:23-30. Chern discloses the same and therefore discloses claim 2. Decl. ¶¶ 110-111.

Chern discloses “updat[ing] position information” at the handset “depending on time elapsed and distance traveled” “to ensure accurate directions.” Chern, [0052], [0054]. The handset/user is also directed to ignore information that is not associated with the original direction of travel and to follow instead an “alternative

³ The terms “delete” and “ignore” only relate to downloaded “instructions to delete or ignore certain information that is not within the direction of travel” not the affirmative steps of deleting or ignoring the directions once instructions are received. Ex. 1001, 5:18-23 (emphasis added).

route ... directed to backtrack to the passed waypoint” when the user passes a way point along the original direction of travel. Chern, [0054].

3. Claim 7: “The method of claim 1, wherein the signal interference comprises failure to detect a signal over a time period.”

Chern in combination with Garceran renders obvious claim 7 because, as described for claim 1, Garceran discloses that a handset/wireless unit “determines” signal quality measurements using “path loss and/or interference level[s]” “associated with or corresponding to the location of the wireless unit.” Garceran, 2:21-42, 11:19-22; Decl. ¶ 113. Path “loss” and “interference” as the name indicates, includes a failure to detect the communication signal. Garceran, 11:47-53. Thus, in combination, Chern’s handset detects signal interference, including a failure to detect a signal overtime due to path loss, as taught by Garceran. Decl. ¶ 112.

4. Claim 8: “The method of claim 7, wherein the signal is an expected signal.”

Chern in combination with Garceran renders obvious claim 8 because, as described for claim 1, Garceran discloses that the handset expects to use the base station signal to inform its location, but its capacity to do so is limited based on environmental factors e.g., “weather, traffic load, path loss and/or interference level.” Garceran, 2:39-42. Thus, in combination, Chern’s handset also expects to

use the base station signal to inform its location, as taught by Garceran. Decl. ¶ 113.

5. Independent Claim 11

a. [11preamble]: “A method, comprising:”

Chern discloses [11preamble] because Chern discloses “a location-based information retrieval system and method for wireless communication devices” and a method for requesting and receiving directions over a network. Chern, [0027], [0044]-[0054], FIG. 3; Decl. ¶ 114.

b. [11a]: “receiving, by a server, position information from a mobile communication device,”

Chern discloses [11a] because, as explained for [1d], Chern discloses transmitting a handset’s (mobile communication device) “determined” location “to server 136 over wireless network 140.” Chern, [0044]. Decl. ¶ 115.

c. [11b]: “wherein the position information includes global positioning system (GPS) information and additional information about a local position of the mobile communication device other than the GPS information, wherein the additional information comprises an indication of signal interference detected at the mobile communication device;”

Chern in combination with Garceran renders obvious [11b]. Decl. ¶¶ 116-121.

As explained for [1b], Chern discloses transmitting position information corresponding to GPS information to a server. Chern, [0040], [0045], [0084]. For

example, when the user requests directions to a destination, “the request is communicated to server 136 over wireless network 140” and “the handset location determined by position determination system 134 is also provided to server 136 to provide a starting point for the directions.” Chern, [0044].

As explained in [1c], Chern discloses detecting additional information at the handset to improve the accuracy of its position determination system, and sending both the GPS and additional information to a server. Chern, [0040]. For example, “[i]n one implementation, a speed of travel parameter is provided by handset 130 along with the current position” to allow the server to determine whether it needs to “update the position information” for direction calculation purposes. Chern, [0054]. Although Chern discloses that “any other useful location or position parameters” detected at the handset can also be used to determine the handset’s location or position, Chern does not disclose that the additional information includes an indication of signal interference. Chern, [0040].

Garceran renders obvious additional information comprising an indication of interference, as also explained for [1b]-[1c], because Garceran’s handset (1) “determines,” i.e., detects, at the wireless unit, “operating conditions or parameters, such as time, weather, traffic load, path loss and/or interference level” (associated information) and (2) “transmit[s] the [GPS] location information and associated signal quality or other information” i.e., an indication of the signal interference, to

a serving base station 54 (FIG. 2) so that it is received by a remote source.

Garceran, 2:39-42, 6:31-44, 59-62; Decl. ¶ 119.

i. Motivation to Combine Detection of Signal Interference with Chern's System

As explained for [1c], a POSITA would have understood the benefit of sending the associated signal quality (indication of interference) in addition to the GPS information, and would have been motivated and found it obvious to configure Chern's handset to use multiple sources of position information, including an "associated signal quality or other information," taught by Garceran, to improve location determination and the location-based services of Chern. Decl. ¶ 120 (citing Kitching, 3, 7, 9, 12-13; Djuknic, 1-3). Such an improvement would have been especially useful where environmental conditions, e.g., weather or building structures, limit, block, or otherwise prevent a GPS receiver from acquiring information from GPS satellites. Kitching, 9-13; Djuknic, 1-3.

ii. Expectation of Success

As explained for [1c], configuring Chern's handset to detect signal interference, and generate/transmit an indication of the signal interference would have only required routine skill to implement. Garceran, 6:31-44, 59-62; *see also* Chern, [0082] (explaining that location-based service methods "may be implemented as computer programs, software or hardware" and functions relating to handset "may be coded in processor 104 or could be stored in memory 114.");

Kitching, 9-13 (highlighting experimental results demonstrating the utility and benefits of combining GPS and base station position information, and further discussing system modifications that may be required to implement the modification); Djuknic, 1-2 (describing ways to implement the combined technologies). Thus, a POSITA would have also had a reasonable expectation of success in modifying the server to receive the position information including GPS and signal quality (indication of interference). Decl. ¶ 121.

- d. **[11c]-[11d]: “determining, by the server, navigation information associated with the local position based on both the GPS information and the indication of signal interference, wherein the navigation information comprises data for plotting a course on a map including the local position of the mobile communication device”**

Chern in combination with Garceran renders obvious determining, by the server, navigation information associated with the local position based on both the GPS information and the indication of signal interference for the reasons explained for [1e]. Decl. ¶¶ 122-123.

Chern’s server generates a “route” and “driving directions” (navigation information comprising data for plotting a course on a map) from a “starting point” corresponding the “determined” “handset location” (including the current location of the mobile communication device). Chern, [0044].

e. **[11e]: “and transmitting, by the server, the navigation information to the mobile communication device.”**

Chern in combination with Garceran renders obvious transmitting, by the server, the navigation information to the mobile communication device, because Chern discloses transmitting the driving directions (navigation information) to “handset 130 over network 140” where they are displayed or audibly rendered to the user” as “textual driving directions[and] a map showing the route.” Chern, [0044]; Decl. ¶ 124.

6. **Claim 14: “The method of claim 11, wherein the additional information further comprises information about at least one base station which is communicating with the mobile communication device.”**

Chern in combination with Garceran renders obvious claim 14 because the additional information includes the base station’s identity. *Garceran*, Abstract, 2:21-28; Decl. ¶¶ 125-126.

Claim [11b] defines the additional information as comprising the indication of signal interference. Garceran discloses that its indication of signal interference (additional information) is “linked with additional parameters, such as wireless unit type, wireless unit identity, frequency, operating conditions and/or base station identity.” *Garceran*, Abstract, 2:21-28 (emphasis added). Decl. ¶ 133 Thus, as combined, Chern’s handset detects additional information including the base

station identity (information about at least one base station), as taught by Garceran.

Decl. ¶ 133.

7. Claim 16: “The method of claim 11, wherein determining the navigation information comprises comparing the indication of signal interference with interference signatures in a database of environmental factors.”

Chern in combination with Garceran renders obvious claim 16 because the combination teaches using a database to determine the driving directions (navigation information), including comparing the signal quality location information (indication of signal interference) with RF signal strengths corresponding to each coverage area (interference signatures) contained in the database. Garceran, 3:26-55, 7:66-8:9; Chern, [0043], [0051]-[0053]; Decl. ¶¶ 127-132.

Chern discloses using a database to determine the user’s route/directions (navigation information) and that “the types of information stored in database 138 are virtually limitless.” Chern, [0043], [0051]-[0053]. Chern does not expressly disclose that its database includes interference signatures to compare with the indication of signal interference, but Garceran does.

Garceran discloses “storing location and associated information,” i.e., GPS and signal quality information (an indication of signal interference) sent from the wireless unit to the serving base station, in an RF coverage storage or database. Garceran, 7:46-51. “For example, using the location of the wireless unit and

collect[ed] associated or corresponding data for the wireless unit at that location, the wireless communications system 50 can produce an RF database or storage 52 to represent or provide an RF coverage map for a geographic region serviced by a serving base station(s) and/or neighboring base stations.” Garceran, 3:26-33. The database includes, among other things, “radio signal strength (RSSI), bit error rate (BER), frame error rate (FER) or other signal quality measurements, of the base station’s transmit signal at a known frequency,” i.e., interference signatures. Garceran, 3:32-45; Decl. ¶ 136.

A POSITA would have understood that the RF coverage database is a database of environmental factors including interference signatures, as described in the ’416 patent, because “environmental information may include the power and/or type of cellular reception” and Chern’s RF coverage data is “information about cellular reception in various areas” that represents “characteristics as a function of position” i.e. coverage strength as a function of the mobile unit’s position. Ex. 1001, 5:58-62, 6:42-52; Decl. ¶ 130.

When the wireless unit powers up and “registers with” a local base station, the wireless communications system compares the wireless unit’s location information with the information contained in the database to determine which base station “currently services the particular location [of] the wireless unit.” Garceran, 7:66-8:9. Thus, Garceran also discloses comparing the indication of

signal interference (signal quality location information) with interference signatures (RF signal strengths corresponding to each coverage area) in the database. Garceran, 3:26-55, 7:66-8:9.

A POSITA would have been motivated and found it obvious to incorporate *Garceran*'s RF coverage information, which informs the signal quality information, in Chern's database to improve the navigation function. Chern, [0043]; Garceran, 3:26-45; Decl. ¶ 132. A POSITA would have had a reasonable expectation of success in adding and utilizing the data in the database because the types of information that can be included in Chern's database are "virtually limitless," and such a modification would have only required routine skill to implement. Decl. ¶ 132.

8. Independent Claim 24:

a. [24preamble]: "A system, comprising:"

Chern discloses [24preamble] because Chern discloses a "a location-based information retrieval system and method for wireless communication devices" and a system for requesting and receiving directions over a network. Chern, [0027], [0044]-[0054], FIG. 2; Decl. ¶ 133.

b. [24a]: "a mobile communication device located at a current position;"

Chern discloses [24a] because the system includes a handset (mobile communication device) located at a current location of a user. Chern, [0044]-

[0045], FIGS. 1, 3, 4. The current location may be a starting point along a route.

Chern, [0054]; Decl. ¶ 134.

- c. **[24b]: “a base station configured to receive wireless communications from the mobile communication device,”**

Chern discloses [24b] because the system includes base stations 112 for relaying communications from the handset to a server over a “wireless network.”

Chern, [0032], [0034], [0042, [0043]; Decl. ¶ 142. Base station 112 “is typically within a geographic area known as a “cell” and handles communications for all wireless devices within the cell” and wireless communication “[n]etwork 140 is typically comprised of a plurality of base stations that provide relay points for communication.” Chern, [0032], [0043], FIG. 2; Decl. ¶ 135.

- d. **[24c]: “wherein the wireless communications comprise (GPS) information and additional information about the current position of the mobile communication device, and wherein the additional information comprises an indication of signal interference detected at the mobile communication device;”**

Chern in combination with Garceran renders obvious the wireless communication including GPS information and an indication of signal interference detected at the handset for the reasons explained for [1a]-[1c]. Decl. ¶ 136.

- e. [24d]: “and a remote processor configured to:
communicate with the mobile communication device
via the base station,”

Chern discloses [24d] because Chern discloses a remote server 136 for receiving the wireless communication containing the position information from the handset via the wireless network 140 containing base stations 112. Chern, [0043], [0044], [0051]-[0054], FIGS. 2, 14. Decl. ¶ 137.

For example, “the handset location determined by position determination system 134 is also provided to server 136 to provide a starting point for the directions.” Chern, [0044]. The remote sever is a remote processor because “[t]he portions relating to the steps carried out by server 136, such as FIG. 14, preferably reside in a processor or memory in server 136.” Chern, [0082] (emphasis added), FIGS. 2, 14.

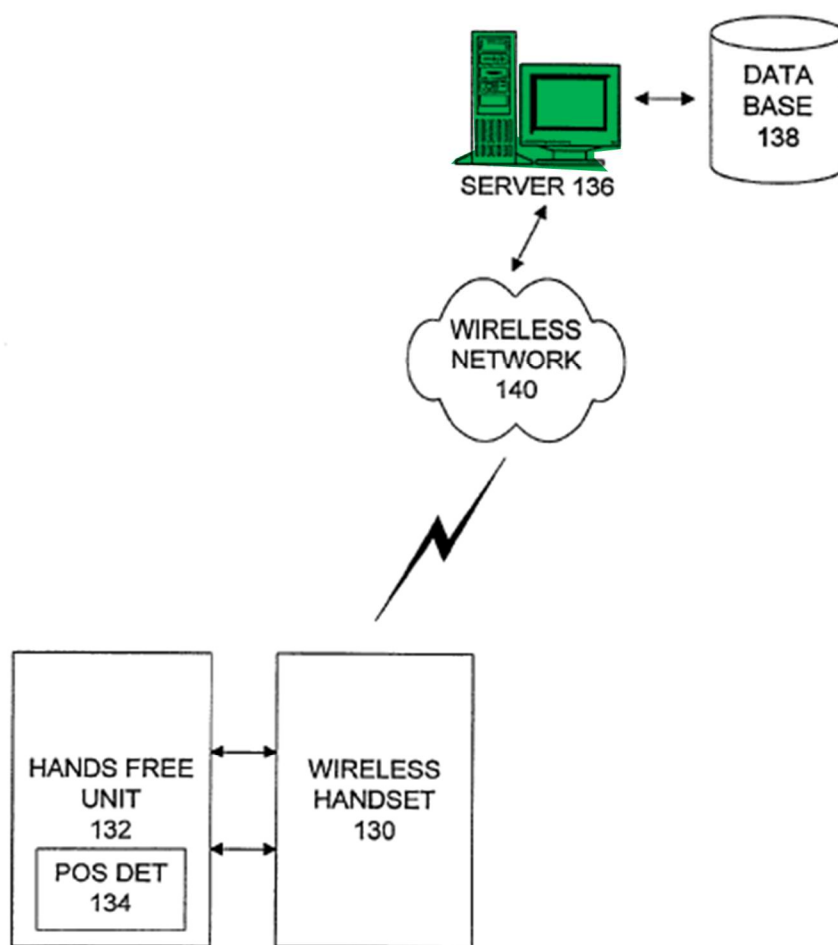


Fig. 2

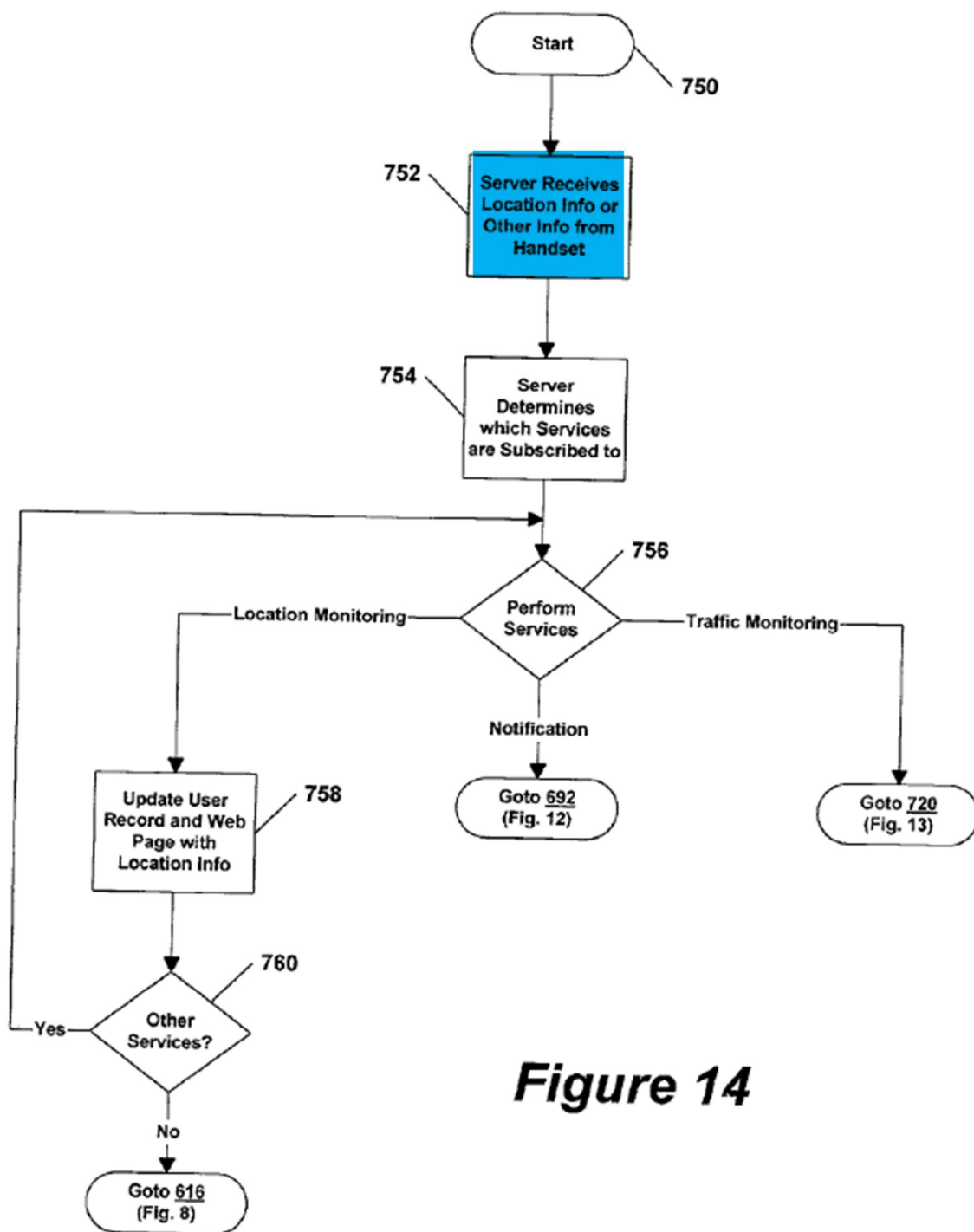


Figure 14

Chern, FIGS. 2, 14.

- f. **[24e]: “wherein in response to receiving data from the mobile communication device, the remote processor is further configured to: generate navigation information associated with the current position of the mobile communication device, wherein the navigation information comprises data for plotting a course on a map including the current position of the mobile communication device;”**

Chern in combination with Garceran renders obvious [24e] because, as explained for [11]c-[11d], Chern’s server generates a “route” and “driving directions” (navigation information comprising data for plotting a course on a map) from a “starting point” corresponding to the “determined” “handset location” (including the current location of the mobile communication device). Chern, [0044], [0051]-[0054]; Decl. ¶ 138 Because the steps “carried out” by the processor “resid[ing]” in the server, as discussed in [24d], the remote processor generates the navigation information. Chern, [0082]; Decl. ¶ 138.

- g. **[24f]: “and transmit the navigation information for displaying the map on the mobile communication device.”**

Chern discloses [24f] because, as explained for [11e], Chern’s server transmits the driving directions (navigation information) to “handset 130 over network 140” where they are displayed or audibly rendered to the user” as “textual driving directions[and] a map showing the route.” Chern, [0044]; Decl. ¶ 139.

9. Independent Claim 25

Claim 25 is directed to a memory device performing the operations of claim 1, and is obvious over Chern and Garceran for the reasons explained for claim 1.

Decl. ¶¶ 140-147.

- a. **[25preamble]: “A memory device having instructions stored thereon that, in response to execution by a processing device, cause the processing device to perform operations comprising:”**

Chern discloses [25preamble] because Chern discloses a “wireless communication device” such as a handset, including “[a] computer program or set of instructions ... coded or otherwise implemented on the [wireless communication device] processor” and memory 114 for “stor[ing] program code and provid[ing] storage space for data useful in executing the program code.” Chern, [0031]-[0033]; Decl. ¶ 141. Executing the coded instructions causes the processor to “direct[] the overall operation” and “functionality” of the device including operations recited [25a]-[25e] to be performed, as explained below.

- b. **[25a]: “generating location data associated with a current position of a mobile communication device based on one or more global positioning system (GPS) signals;”**

Chern discloses [25a] because Chern’s operations include generating, using a GPS receiver (position determination system) of the handset, location data associated with “user’s current location” and “the handset location.” Chern, [0040], [0044], [0045]. As explained for [1a], the GPS receiver generates the data by

“communicat[ing] with the constellation of GPS satellites” and is therefore based one or more GPS signals. Chern, [0084]; Decl. ¶ 142.

c. [25b]-[25c]: “detecting signal interference at the mobile communication device; generating an indication of the detected signal interference;”

Chern in combination with Garceran renders obvious detecting signal interference at the handset (mobile communication device) and generating an indication of the detected interference, as explained for [1b]. Decl. ¶¶ 89-98, 143.

Because Chern’s executed instructions “direct the overall operation” and “functionality” of the device, as explained for [25 preamble], the combination likewise renders obvious performing the detecting and generating in response to executing the instructions. Decl. ¶ 143.

d. [25d]: “transmitting the location data and the indication of the detected interference to a remote processing device;”

Chern in combination with Garceran renders obvious transmitting the GPS-based location data and the quality information (an indication of interference) to a remote processor operating on a server, as explained for [24d] because “the handset location determined by position determination system 134 is also provided to server 136 to provide a starting point for the directions.” Chern, [0044]; *see also* Garceran, 2:12-28, 6:59-62 (describing “transmit[ing] the location information and

associated signal quality or other information” to a remote source to determine the wireless unit’s location); Decl. ¶ 144.

Chern’s **remote sever** is a remote processor because “[t]he portions relating to the steps carried out by server 136, such as FIG. 14, preferably reside in a processor or memory in server 136.” Chern, [0082] (emphasis added), FIGS. 2, 14; Decl. ¶ 145.

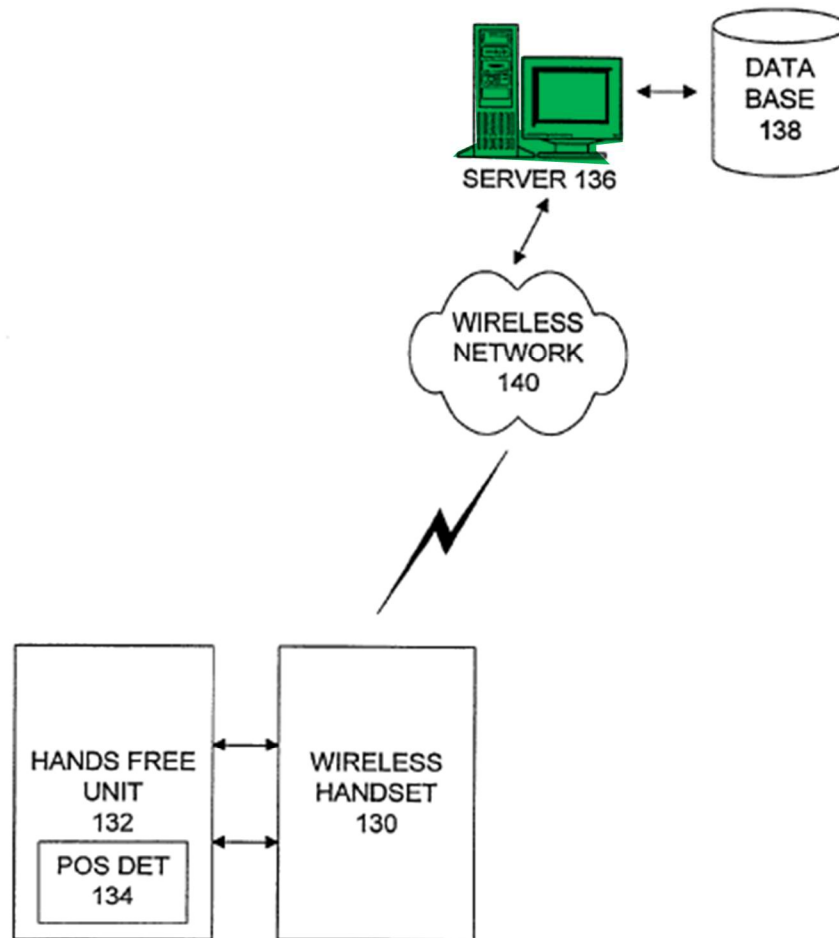


Fig. 2

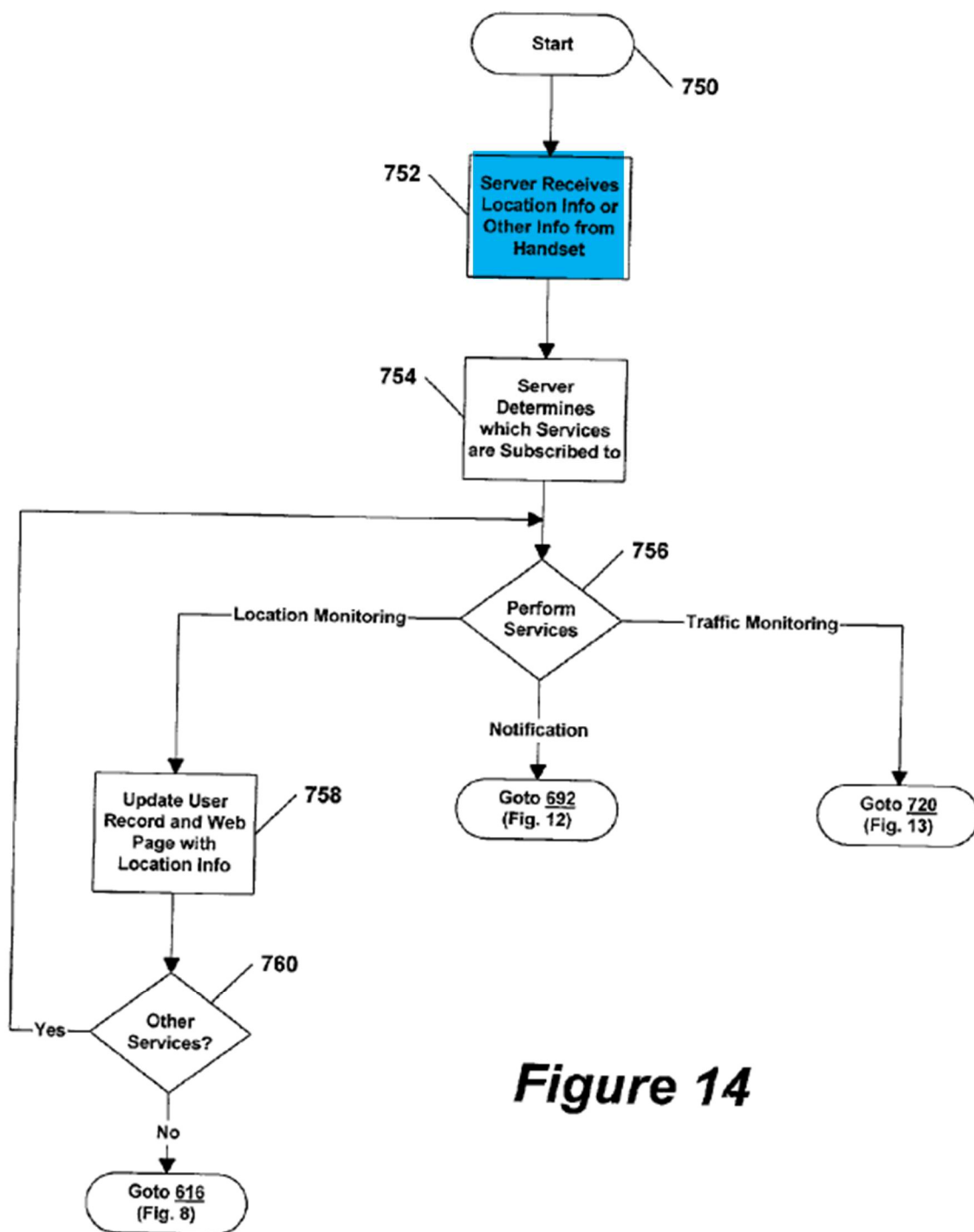


Figure 14

Chern, FIGS. 2, 14.

- e. **[25e]: “receiving navigation information associated with the current position, wherein the navigation information comprises data for plotting a course on a map including the current position of the mobile communication device.”**

Chern in combination with Garceran renders obvious receiving navigation information including data for plotting a course on the map that includes the current position of the handset because, as explained in [1e], Chern generates a “route” and “driving directions” (navigation information comprising data for plotting a course on a map) from a “starting point” corresponding to the “determined” “handset location” (including the current location of the mobile communication device), and the driving directions (navigation information) are received by the “handset 130 over network 140 and are displayed or audibly rendered to the user” as “textual driving directions[and] a map showing the route.” Chern, [0044]; Decl. ¶¶ 146-147.

Because the executed instructions “direct the overall operation” and “functionality” of the device, as explained for [25preamble], the combination likewise renders obvious performing the receiving in response to executing the instructions. Decl. ¶ 147.

- 10. Claim 26: “The memory device of claim 25, further comprising receiving supplemental information associated with the current position of the mobile communication device, wherein the supplemental information is received from a first remote source, and wherein the navigation information is received from a second remote source.”**

Chern in combination with Garceran renders obvious claim 26. Decl.

¶¶ 148-152.

As explained for [24b]-[24e], the receiving base station is a first remote source (Chern, [0032], [0034], [0042, [0043] (“wireless communication “[n]etwork 140 is typically comprised of a plurality of base stations that provide relay points for communication.”); Garceran, Abstract, 2:11-20) and as explained for [25d], the navigation information is received from a remote server—a second remote source. Chern, [0043], [0044], [0051]-[0054], FIG. 2; *see also* [24d]-[24e], *supra*.

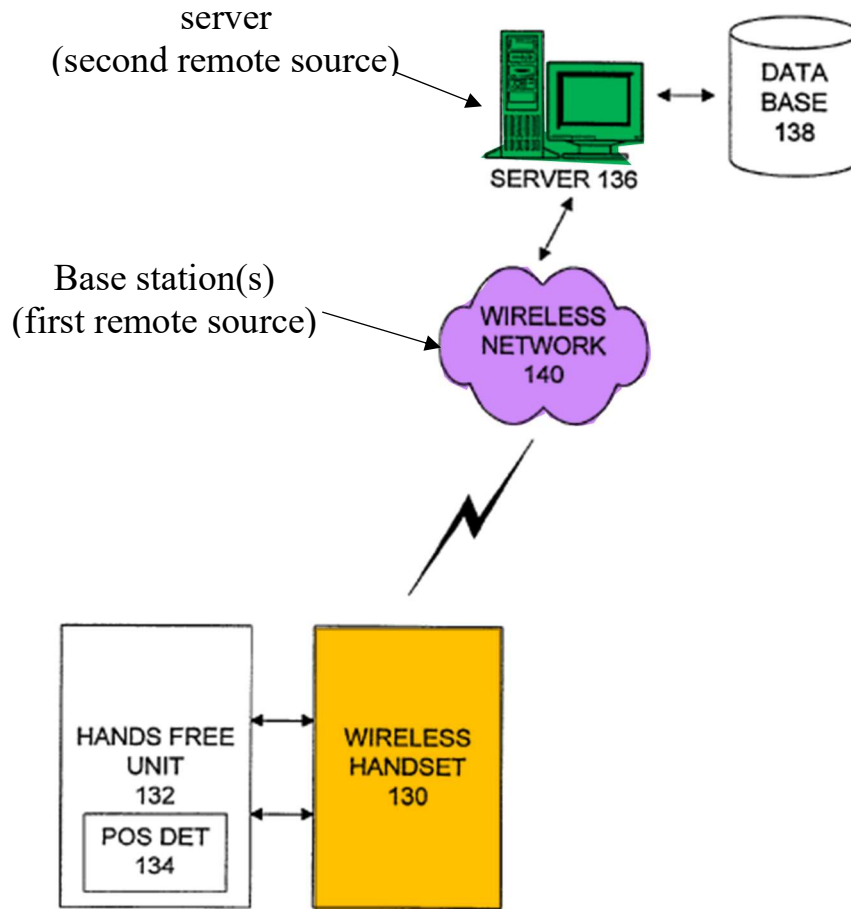


Fig. 2

Chern, FIG. 2

Garceran further discloses receiving supplemental “information associated with or corresponding to the location of the wireless unit” that is “linked with additional parameters, such as wireless unit type, wireless unit identity, frequency, operating conditions and/or base station identity.” Garceran, Abstract, 2:21-28. The base station identity helps to identify which base station performed the position

measurement thereby providing another indication of the communication device's position. Garceran, 4:39-44.

Accordingly, it would have been obvious to receive a base station's identity (supplemental information) from the base station, as taught by Garceran, to identify which base station performed the position measurement thereby providing another indication of the communication device's position. Garceran, 4:39-44; Decl. ¶ 151.

Such a modification would have only required using existing components for their routine purpose (e.g., transmitting existing identifying information from the base station (first remote source) connected to the mobile terminal to the server (second remote source) performing the position determination and navigation calculation) and would have been within the purview of a person skilled in the art. *See e.g.*, Kimoto 31:31-43 (when a mobile terminal “enters a communication area of the radio base station 6 under a communicable state (a state in which a power source is ON), the mobile terminal 4 is connected to the radio base station 6 by detecting identification information (a CSID) of the radio base station 6 contained in radio waves from the radio base station 6. If the user makes a demand for information of a map ...the mobile terminal 4 transmits the detected CSID as its own position information to the information center 5 via the radio base station 6 over the public network 7.”) (emphasis added); Decl. ¶ 152.

11. Claim 27: “The memory device of claim 26, wherein the first remote source comprises a base station in communication with the mobile communication device.”

Chern discloses claim 27 because, as explained for claim 26, Chern discloses first and second remote sources for communicating with the handset. Chern, [0034], [0042, [0043], FIG. 2; Decl. ¶ 160. The first remote source includes the base station 112 for receiving and sending wireless communications. Chern, [0032], [0034], [0042], [0043], FIG. 2; Decl. ¶ 153.

12. Claim 28: “The memory device of claim 27, wherein the supplemental information comprises an identity of the base station.”

Chern in combination with Garceran renders obvious claim 28. Decl. ¶¶ 154-155.

As explained for claim 26, Chern as modified by Garceran renders obvious receiving supplemental information including an identity of the base station because Garceran further discloses receiving “information associated with or corresponding to the location of the wireless unit” that is “linked with” additional parameters, such as ... base station identity” to help identify which base station performed the position measurement and provide another indication of the communication device’s position, as was known in the art. Garceran, Abstract, 2:21-28, 4:39-44; Kimoto, 31:31-43; Decl. ¶ 155.

13. Claim 29: “The memory device of claim 27, wherein the second remote source comprises a network server associated with the mobile communication device.”

Chern discloses claim 29 because, as explained for claims 26 and 27, Chern discloses first and second remote sources for communicating with the handset. Chern, [0034], [0042, [0043], FIG. 2; Decl. ¶ 156. The first remote source includes a base station 112 for receiving and sending wireless communications, and the second remote source includes remote network server 136. Chern, [0032], [0034], [0042, [0043], FIG. 2.

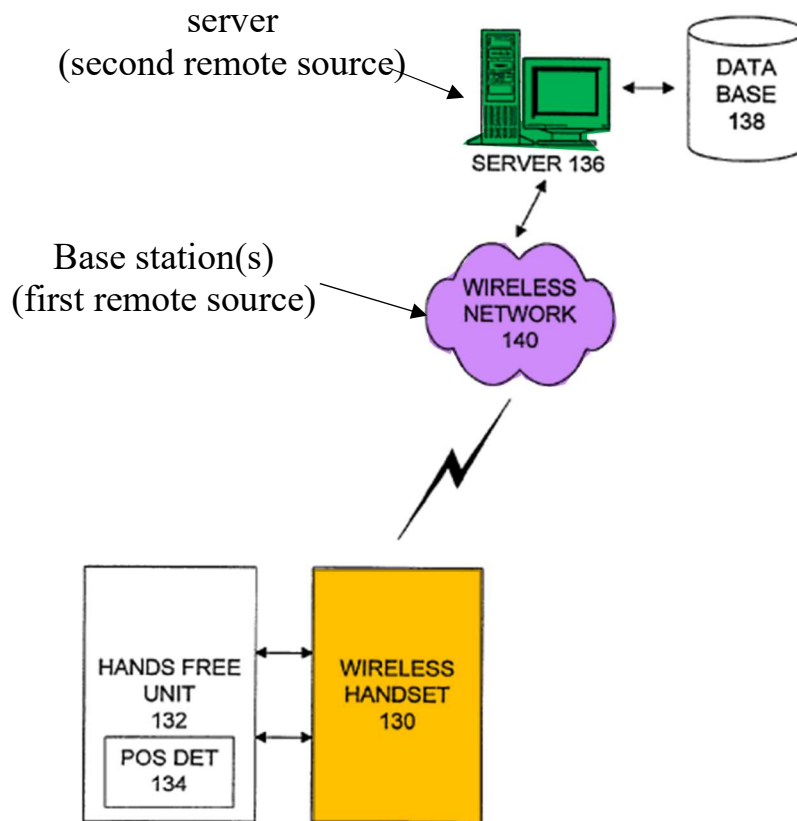


Fig. 2

Chern, FIG. 2

VI. Ground 2: Claims 11 and 15 Are Obvious Over Chern and Garin.

The '416 patent arguably covers an alternate embodiment in which the wireless communication device detects GPS signal interference, and the server determines navigation information based on a combination of GPS information and Bluetooth-based location information obtained using a Bluetooth transponder:

The positioning information may include information obtained from GPS satellites, and information obtained from other positioning elements such as repeaters and transponders... The transponder may transmit pseudorange information of the type that would be received by GPS receivers, but at a higher power level than could be received from the actual GPS satellites. Alternatively, it may transmit this information in locations which are otherwise shielded against such satellite communications, such as indoors or under tree cover. The transponder 605 may also include bluetooth transponders which may transmit directly to a bluetooth receiver 607 within the phone 600.”).

Ex. 1001, 4:48-64; Decl. ¶ 157. Ground 2 addresses this alternative.

A. Garin

Garin, filed February 28, 2001, is prior art under at least 35 U.S.C. § 102(e).

Garin discloses geolocating a wireless communication device and using the location information to track the device and provide navigation. Garin, 2:28-33.

The wireless handset switches between operational “modes” based on detected GPS signal interference and uses additional “information from outside the wireless

communications network as well as outside of the GPS satellite system” to

“approximate” the handset’s location. Garin, 3:53-62, 4:3-8, 6:55-7:5, 7:33-34, 6:26-31, 7:55-67, 10:34-39.

Garn’s handset uses Bluetooth information acquired from a Bluetooth network via the handset’s Bluetooth sensor to generate “augmented” position information when there is a “lapse” in GPS signals. Garin, 7:59-67, 8:49-62. The handset sends the “data ‘fusion’” of Bluetooth and GPS information to a geolocation server, which uses the information to enhance “navigation functions” (e.g., determining the “relative location of the cellular user to other landmarks,” and “directions for the cellular user via internet maps or other GPS mapping techniques, etc.”) Garin, 1:52-59, 7:59-65. Garin’s handset’s “GPS acquisition, tracking, and navigation functions can be enhanced with inputs from the Bluetooth network without using the cellular network.” Garin, 7:62-65, 8:49-56, 10:34-39.

Garin is analogous to the ’416 patent because it is directed to the same technical field: location-based services for wireless communication devices.

Compare Ex. 1001, 4:34-51, 5:4-5, *with* Garin, Abstract, 1:52-59, 2:28-33, 7:59-65; Decl. ¶ 79.

B. Claims

1. Claim 11

a. [11preamble]: “A method, comprising:”

Chern discloses “a location-based information retrieval system and method for wireless communication devices” and a method for requesting and receiving directions over a network. Chern, [0027], [0044]-[0054], FIG. 3; Decl. ¶ 158.

b. [11a]: “receiving, by a server, position information from a mobile communication device,”

Chern discloses [11a] because, as explained in Ground 1, element [1d], Chern discloses transmitting a handset’s (mobile communication device) “determined” location “to server 136 over wireless network 140.” Chern, [0044]. Decl. ¶ 159.

c. [11b]: “wherein the position information includes global positioning system (GPS) information and additional information about a local position of the mobile communication device other than the GPS information, wherein the additional information comprises an indication of signal interference detected at the mobile communication device;”

Chern in combination with Garin renders obvious [11b]. Decl. ¶¶ 160-165.

As explained for Ground 1, element [1b], Chern discloses transmitting position information corresponding to GPS information to a server. Chern, [0040], [0045],[0084]. For example, when the user requests directions to a destination, “the request is communicated to server 136 over wireless network 140” and “the

handset location determined by position determination system 134 is also provided to server 136 to provide a starting point for the directions.” Chern, [0044].

As explained for Ground 1, element [1c], Chern discloses detecting additional information at the handset that would improve the accuracy of its position determination system, and sending both the GPS and additional information to a server. Chern, [0040]. For example, “[i]n one implementation, a speed of travel parameter is provided by handset 130 along with the current position” to allow the server to determine whether it needs to “update the position information” for direction calculation purposes. Chern, [0054]. Although Chern discloses that “any other useful location or position parameters” detected at the handset can also be used to determine the handset’s location or position, Chern does not disclose that the additional information includes an indication of signal interference. Chern, [0040]. But Garin does.

Garin discloses additional information comprising an indication of interference, teaching using additional positional “information from ... outside of the GPS satellite system” to “approximate” the handset’s location. Garin, 3:53-62, 4:3-8, 6:55-7:5, 7:33-34, 6:26-31, 7:55-67, 10:34-39. For example, when the handset detects the “lapse” in one or more GPS signals, the handset’s Bluetooth sensor uses Bluetooth information acquired from a Bluetooth network to generate “augmented” position information—a “data ‘fusion’” of “information from the

GPS satellites and a Bluetooth network.” Garin, 7:59-67, 8:49-62. The use of received Bluetooth information is an “indication of the signal interference” because, like in the ’416 patent, it signifies a “lapse” in one or more GPS signals, i.e., interference. Garin, 8:49-62; Ex. 1001, 4:53-64 (using a Bluetooth transponder to transmit “information in locations which are otherwise shielded against such satellite communications, such as indoors or under tree cover.”)

i. Motivation to Combine Garin’s Detection of Signal Interference with Chern’s System

A POSITA would have been motivated and found it obvious to configure Chern’s handset to use multiple sources of position information, including a “data ‘fusion’” of Bluetooth and GPS, to improve location determination and the location-based services of Chern, as taught by Garin. Garin, 7:62-65 (“GPS acquisition, tracking, and navigation functions can be enhanced with inputs from the Bluetooth network without using the cellular network.”); Decl. ¶ 164. A POSITA would have likewise been motivated to transmit and receive at the server the GPS and Bluetooth (indication of signal interference) information to improve the location-based services provided by the server. Decl. ¶ 164. Such an improvement would have been especially useful where environmental conditions, e.g., weather or building structures, limit, block, or otherwise prevent the GPS receiver from acquiring information from the GPS satellite. Decl. ¶ 164.

ii. Expectation of Success

Configuring Chern's handset to generate and transmit Bluetooth information when GPS signal interference is detected (e.g., GPS signal strength decreases) would have only required routine skill to implement, e.g., integrating conventional Bluetooth sensor hardware and corresponding computer instructions. Chern, [0082] (explaining that location-based service methods "may be implemented as computer programs, software or hardware" and functions relating to handset "may be coded in processor 104 or could be stored in memory 114."); Decl. ¶ 165. Configuring the server to receive the GPS and Bluetooth information would have only required routine skill to implement for the same reasons; thus, a POSITA would have also had a reasonable expectation of success in modifying the server to receive the position information including GPS and Bluetooth information. Decl. ¶ 165.

- d. [11c]-[11d]: "determining, by the server, navigation information associated with the local position based on both the GPS information and the indication of signal interference, wherein the navigation information comprises data for plotting a course on a map including the local position of the mobile communication device"**

Chern in combination with Garin renders obvious determining, by the server, navigation information associated with the local position based on both the

GPS information and the Bluetooth information (indication of signal interference).

Decl. ¶¶ 166-168.

As explained for [11b], Chern as modified by Garin teaches receiving a “data ‘fusion’” of Bluetooth and GPS information (both the indication of the signal interference and the GPS information) at the remote source.

Chern further discloses using the server to generate a “route” and “driving directions” (navigation information comprising data for plotting a course on a map) from a “starting point” corresponding to the “determined” “handset location” (including the current location of the mobile communication device). Chern, [0044]. Garin similarly teaches using the determined position information for “directions,” determining the “relative location of the cellular user to other landmarks,” and “directions for the cellular user via internet maps or other GPS mapping techniques, etc.” Garin, 1:52-59, 7:59-65. The “directions” (navigation information) contain data including the current location of the handset (“relative location of the cellular user”) and may be used for plotting a course on a map “via internet maps or other GPS mapping techniques.” Garin, 1:52-59.

e. [11e]: “and transmitting, by the server, the navigation information to the mobile communication device.”

Chern in combination with Garin renders obvious [11e] because Chern discloses transmitting the driving directions (navigation information) to “handset 130 over network 140[,],” where they are displayed or audibly rendered to

the user” as “textual driving directions[and] a map showing the route.” Chern, [0044]; Decl. ¶ 169.

2. Claim 15: “The method of claim 11, wherein the additional information further comprises information associated with a local transponder.”

Chern in combination with Garin renders obvious claim 15. Decl. ¶¶ 170-172.

Claim [11b] defines the additional information as comprising the indication of signal interference. As explained for [11b], Garin’s additional information is acquired by, and associated with, a Bluetooth sensor (local transponder). Garin, 7:59-67, 8:49-62, 10:40-55. The handset’s Bluetooth receives location information from nearby Bluetooth transmitters and uses this information when the handset is unable to receive adequate GPS signals. *Garin*, 7:62-65, 8:57-62. The handset then transmits this information as position data. *Garin*, 7:62-65, 8:57-62.

A POSITA would have understood that the Bluetooth information is associated with a local Bluetooth transponder because the handset receives transmitted Bluetooth signals from a “Bluetooth Network” and uses the Bluetooth information in response to the received Bluetooth signals when GPS signals are weak or otherwise unavailable. *Garin*, 7:62-65, 8:57-62; Decl. ¶ 172. This is consistent with the ’416 patent. Ex. 1001, 4:53-64 (explaining that Bluetooth transponders transmit “information in locations which are otherwise shielded

against such satellite communications, such as indoors or under tree cover.”); Decl.

¶ 172.

VII. Ground 3: Claims 20-23 and 30-35 Are Obvious over Yamakita.

A. Yamakita

Yamakita, filed September 19, 1997, and published February 27, 2001, is prior art under at least 35 U.S.C. § 102(e).

Yamakita discloses “analyzing the action of, e.g., a user who is carrying a portable terminal on the basis of information acquired from the portable terminal.” Yamakita, 1:4-6. The portable terminal acquires position information using a GPS sensor and “unique” train sound information corresponding to the “ambient sound data (e.g., noise)” using a microphone. Yamakita, 2:54-58, 3:33-40, 48-51, 4:55-56, FIGS. 2-3. The portable terminal generates and transmits a transmission packet containing the location and noise data to a base station and host terminal (collectively, “remote source”) over a public wireless network. Yamakita, 2:47-52, 3:3-9, 53-60, FIGS. 1, 3, 4 (illustrating contents of the transmission packet).

“Upon receiving the information transferred from the portable terminal,” the host terminal “extract[s]” and processes the GPS and sound (interference) data from the transmission packet to estimate “the position of the user who is carrying the portable terminal 1 at a certain time point, and if he/she is moving, [and] the [user’s] moving means.” Yamakita, 5:64-6:9, 6:37-45, FIG. 7. Once processed, the

host terminal generates and transmits a data packet containing the user's current location to the portable terminal. Yamakita, 6:37-45, 1:41-48. The data packet also includes an action record table, i.e., navigation information including data for plotting a course on a map including the portable terminal's current location. Yamakita, 6:37-45, 1:41-48, FIGS. 14, 18. The portable terminal extracts the action record table and displays it as a map on its LCD display unit. Yamakita, 9:63-10:4, 11:28-31, FIG. 18.

Yamakita is analogous to the '416 patent because it is directed to the same technical field: location-based services for wireless communication devices.

Compare Ex. 1001, 4:33-42, 5:4-5, *with* Yamakita, Abstract, 1:4-6; Decl. ¶ 83.

B. Claims

1. Independent Claim 20

a. [20preamble]: “A system, comprising:”

Yamakita discloses [20preamble] because Yamakita discloses a system “for analyzing the action of, e.g., a user who is carrying a portable terminal on the basis of information acquired from the portable terminal.” Yamakita, 1:4-6, FIG. 1; Decl. ¶ 173.

b. [20a]: “a communication interface configured to receive a communication from a cellular telephone over a cellular telephone network,”

Yamakita discloses [20a] because the system includes a “host terminal” having a communication interface⁴ operated by a “communication control unit” and for receiving a “transmission packet” (communication) from a “portable terminal” such as a cellular phone, over a public “mobile communication network.” Yamakita, 2:47-52, 2:58-66, 3:53-60, 11:24-26, 5:39-42, FIGS. 1-2; Decl. ¶¶ 174-176. The host terminal receives the “packet sent from the portable terminal 1 (packet prepared with processing of the flow chart shown in FIG. 5) ...to analyze the action of the user who is carrying the portable terminal 1.” Yamakita, 5:53-56.

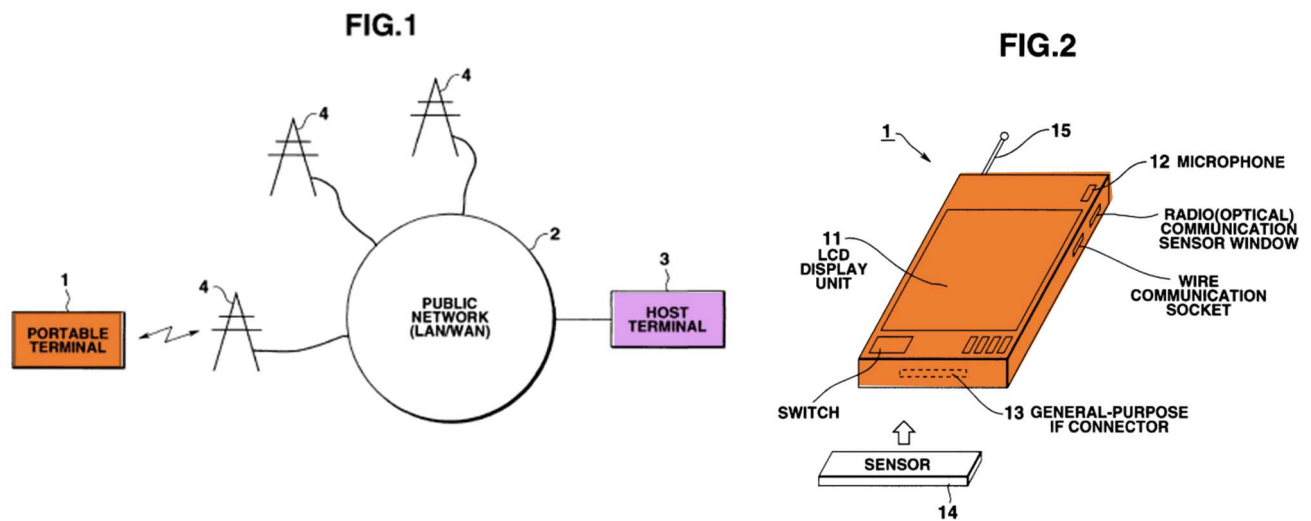
A POSITA would have understood that Yamakita’s network is cellular because it has a “cell range” and “a cell...manage[s] the portable terminal.” Yamakita, 11:24-26; Decl. ¶ 175. Furthermore, Yamakita’s network, like the ’416 patent network⁵, uses a plurality of base stations (cells) to facilitate wireless

⁴ The ’416 patent does not identify a particular structure corresponding to a communication interface. *See generally* Ex. 1001.

⁵ The ’416 patent does not use the term “cellular network.” *See generally* Ex. 1001.

communication between the portable terminal and remote server. *Compare* Ex.

1001, 1:29-35 *with* Yamakita, FIG. 1.



Yamakita, FIGS. 1-2.

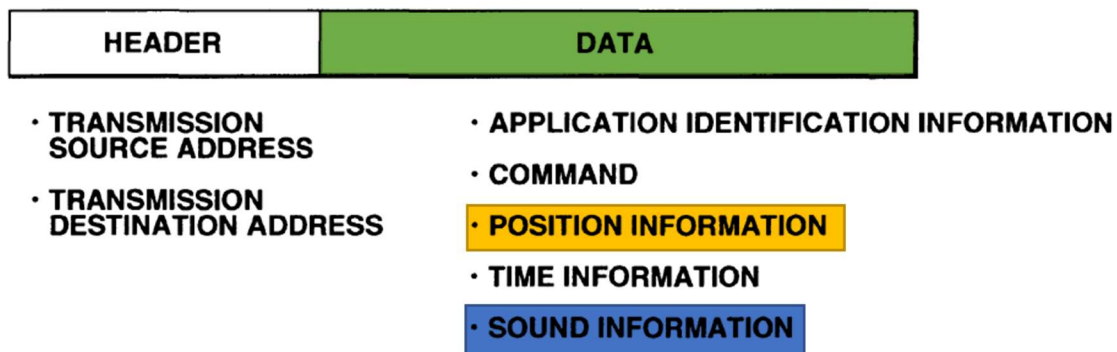
Further still, a POSITA would have also found it obvious to use a cellular network to facilitate long-range communications between the portable terminal and host terminal (server), as was well known in the art. *See, e.g.*, Garin, 2:45-47, 5:45-50 (describing “a method and a system for delivering GPS data to wireless communications systems, including cellular and PCS Subscribers” using a “cellular network.”); Obradovich, 1:4-12, 22:4-7 (describing a navigation system and cellular device that communicates using “cellular phone networks” to enable “up-to-date information” during “travel.”); Naito, 1:1-9, 5:39-53 (describing a communication network system including a “plurality ... of cellular base stations” for facilitating wireless communication between a “portable terminal” and a

remote “host terminal” and explaining that “[t]he portability of the terminal apparatuses is particularly enhanced when high mobility is achieved through connection for radio communication between the terminals and the host computer.”); Decl. ¶ 176.

- c. **[20b]: “wherein the communication comprises global positioning system (GPS) information and environmental information about a current position of the cellular telephone, and wherein the environmental information is acquired by one or more sensory input devices of the cellular telephone;”**

Yamakita discloses [20b] because the transmission packet (communication) includes position (GPS) and sound information (environmental information) about the portable terminal’s current location, wherein the sound information is acquired by a microphone of the portable terminal (sensory input device). Yamakita, FIG. 4, Abstract, 2:54-63, 4:21-34; Decl. ¶¶ 177-179.

FIG.4



Yamakita, FIG. 4.

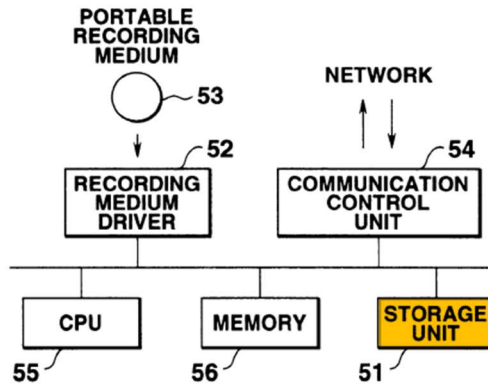
The position information corresponds to GPS information acquired using a “GPS sensor,” that “detects the position (e.g., aa°bb’ north and cc°dd’ east) of the portable terminal 1 at a certain time point” Yamakita, 2:54-58, 3:48-51.

The sound information corresponds to “ambient sound data (e.g., noise)” acquired using portable terminal microphone 12. Yamakita, 4:28-30, 4:32-34, 4:55-56. Thus, when the portable terminal is located at a train station, “sounds unique to the train” are detected “at the timing when the position information is detected” and the sound information communicated in the transmission packet reflects the same. Yamakita, 3:3-6, 3:48-51, 4:28-34, 6:26-33.

d. [20c]: “a database configured to store local information associated with the current position;”

Yamakita discloses [20c] because the host terminal includes storage unit 51 (database) storing “map data” (local information) associated with the user’s current position. Yamakita, 2:16-17, 34-35, FIG. 9 (illustrating “map data stored in the host terminal”), FIG. 16 (illustrating “table which stores names on a map and corresponding position information”). Decl. ¶¶ 180-181.

FIG.6



Yamakita, FIG. 6.

More specifically, Yamakita's host terminal 3 stores "map data as shown in FIG. 9," including "map data associated with all railways" local to portable terminal. Yamakita, 6:40-57. "These map data are stored in, e.g., the storage unit 51 and loaded in the memory 56 as a reference, as needed." Yamakita, 6:40-42, 6:53-61. FIGS. 6 (illustrating host terminal having storage unit 51 for storing map data) and 9 (illustrating stored map data). The host terminal also utilizes the table shown in Figure 16 which "stores various names on the map and corresponding position information" including **local information**, e.g., "STATION A" associated with the portable terminal's **current position** " x_{101}, y_{101} ." Yamakita, 9:2-22, FIG. 16.

FIG.9

A RAILWAY	STATION NAME	SECTION	POSITION	APPROXIMATE CURVE
	STATION A		(x_A, y_A)	
		STATION A - POINT B		$y = f_b(x)$
		POINT B - POINT C		$y = f_c(x)$
		POINT C - POINT D		$y = f_d(x)$
		POINT D - STATION B		$y = f_B(x)$
	STATION B		(x_B, y_B)	
B RAILWAY : : : :	⋮			

FIG.16

REGISTRATION POSITION		NAME
x_{101}, y_{101}		STATION A
x_{102}, y_{102}		STATION B
⋮		
x_{501}, y_{501}		HEAD OFFICE
x_{502}, y_{502}		BUSINESS OFFICE
x_{503}, y_{503}		MR. K'S HOME
⋮		

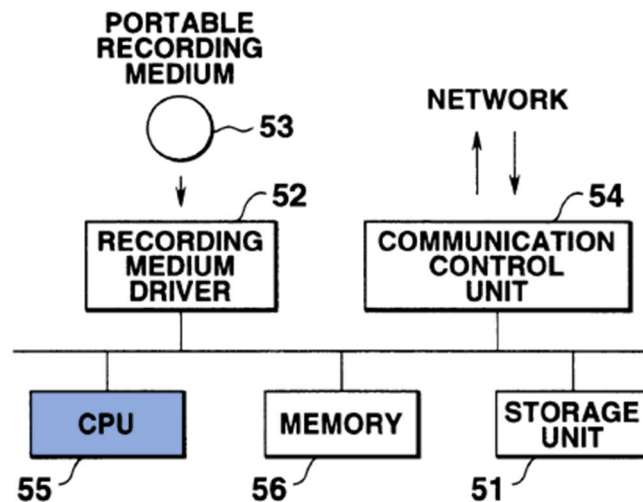
USER
REGISTRATION
DATA {

Yamakita, FIGS. 9, 16.

e. [20d]: “and a processing device configured to:”

Yamakita discloses [20d] because Yamakita’s host terminal includes a CPU (processing device) for loading and executing “programs for realizing the functions of the flow charts shown in FIGS. 7, 10, 11, 12, and 15.” Yamakita, 5:40-51, 10:5-11, FIG. 6; Decl. ¶ 182.

FIG.6



Yamakita, FIG. 6.

f. [20e]: “process the GPS information and the environmental information;”

Yamakita discloses [20e]. ¶¶ 183-186.

As explained for [20a]-[20b], the host terminal receives location, sound, and image data (GPS and environmental information) from the portable terminal.

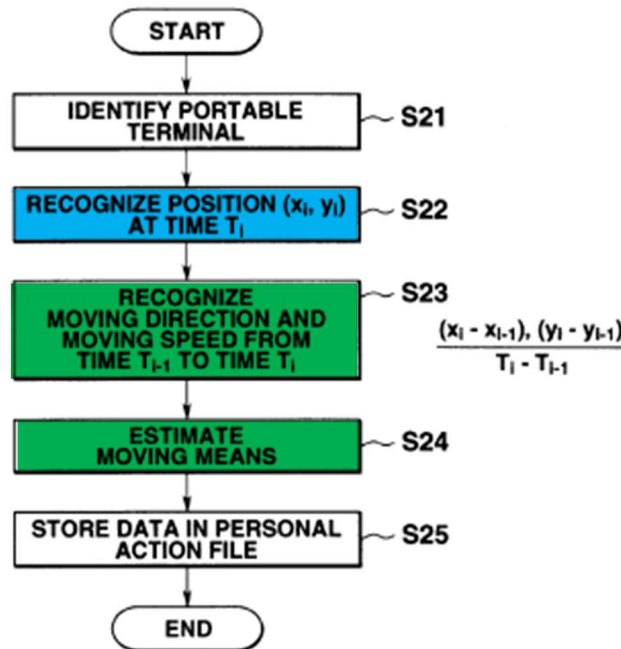
Yamakita, 2:47-52, 2:58-66, 3:3-6, 3:48-51, 3:53-60, 4:21-34, 6:26-33, 11:24-26,
FIG. 4.

Upon receiving the data, the host terminal CPU “executes” a program for preparing “a packet from [the] data acquired by the portable terminal and sending the packet” in accordance with the flow chart illustrated in Figures 5 and 7.

Yamakita, 2:6-8, 4:35-39, 5:43-44, 5:53-56. This program processes both the GPS information and the ambient sound information (environmental information) because it extracts the necessary data and uses it to compile the relevant navigation information into an action table for later transmission, as explained for [20f]-[20g], *infra*.

Yamakita’s [step S22](#) of Figure 7 shows how the host terminal CPU processes the portable terminal’s GPS information—that is, the “position information and time information, which are stored in the data portion of the received packet, are extracted to recognize the position (x_i, y_i) of the portable terminal 1 at time T_i .” Yamakita, 5:64-6:1. Steps [S23-24](#) show how the CPU processes the environmental information, e.g., “sound information stored in the data portion of the received packet” to determine the portable terminal’s “moving means (walking, train, motor vehicle, stop, ...).” Yamakita, 6:1-14.

FIG.7



Yamakita, FIG. 7.

- g. [20f]: “retrieve the local information from the database in response to processing the GPS information and the environmental information;”

Yamakita discloses [20f] because the host terminal retrieves the mapping data associated with the user’s location (local information) from the storage unit 51 (database) in response to the processing discussed for [20e]. Yamakita, 5:64-6:9, 6:37-45, FIG. 7; Decl. ¶¶ 187-189.

More specifically, the host terminal compares the extracted, processed GPS and environmental information to the retrieved local information map data illustrated in Figure. 9, and the local information data table illustrated in Figure 16 to generate an action record table according to the process of Figure 15 as discussed in [20g], *infra*. Yamakita, 6:37-45, 9:2-48, FIGS. 9, 7, 15, 16.

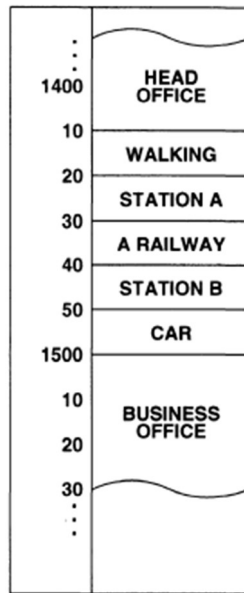
- h. [20g]: “generate mapping information associated with the current position, wherein the mapping information comprises for plotting a course on a map including the current position of the cellular telephone;”**

Yamakita discloses [20g] because the host terminal uses the processed GPS and environmental information to generate an action table (mapping information) for plotting a course on a map that includes the current position of the portable terminal. Yamakita, 6:37-45, 9:2-48; Decl. ¶¶ 190-191.

More specifically, the host terminal compares the extracted, processed GPS and environmental information to the retrieved local information map data illustrated in Figure 9, and the local information data table illustrated in Figure 16 to generate an action record table according to the process of Figure 15. Yamakita, 6:37-45 (“Upon receiving the information transferred from the portable terminal 1, the host terminal 3 executes the processing of the flow chart shown in FIG. 7 to analyze the moving route of the user who is carrying the portable terminal 1. For the purpose of analyzing the route, the host terminal 3 has map data as shown in

FIG. 9.”), 9:2-48 (explaining that “[t]he table shown in FIG. 16 stores various names on the map and corresponding position information” and the “extracted” position information is “checked” by “refer[ring]” to the table shown in Figure 16), FIGS. 9, 7, 15, 16. The generated action record table (mapping information) reflects the user’s current position, route, and mode of transportation (data for plotting a course on a map). Yamakita, 1:41-48, 6:37-45, 9:46-48, FIGS. 7, 14.

FIG.14



Yamakita, FIG. 14.

- i. **[20h]: “and cause the mapping information to be transmitted to the cellular telephone.”**

Yamakita discloses [20h]. Decl. ¶¶ 192-194.

As explained for [20g], the host terminal CPU generates an action record table (mapping information) reflecting the user’s current position, route, and mode

of transportation (data for plotting a course on a map). Yamakita, 1:41-48, 6:37-45, 9:46-48, FIGS. 7, 14.

The host terminal stores the generated action record table containing the current location and route, and upon receiving “a packet for requesting display of the action record table ... from the portable terminal 1,” transfers it in a data packet to the portable terminal (cellular telephone). Yamakita, 9:46-51.

2. Claim 21: “The system of claim 20, wherein the processing device is further configured to generate new mapping information associated with a new position of the cellular telephone.”

Yamakita discloses claim 21 because the CPU (processing device) is configured to generate new mapping information associated with new position information (P_2) and corresponding to, e.g., the movement of “the user who was carrying the portable terminal 1 [and] moved from station A to station B by A railway.” Yamakita, 6:16-42; Decl. ¶¶ 195-196.

Navigation information “STATION A” is associated with, e.g., the local position of the portable terminal (acquired at 14:20), while navigation information “STATION B” is associated with the new position (acquired at 14:40). Yamakita, FIGS. 14, 16, 18.

FIG.14 New mapping information

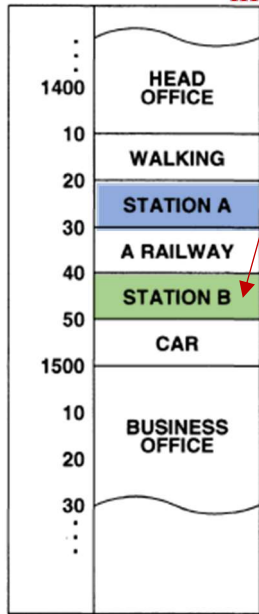


FIG.16

New position

USER
REGISTRATION
DATA

REGISTRATION POSITION	NAME
X ₁₀₁ , Y ₁₀₁	STATION A
X ₁₀₂ , Y ₁₀₂	STATION B
⋮	
X ₅₀₁ , Y ₅₀₁	HEAD OFFICE
X ₅₀₂ , Y ₅₀₂	BUSINESS OFFICE
X ₅₀₃ , Y ₅₀₃	MR. K'S HOME
⋮	

Yamakita, FIGS. 14, 16.

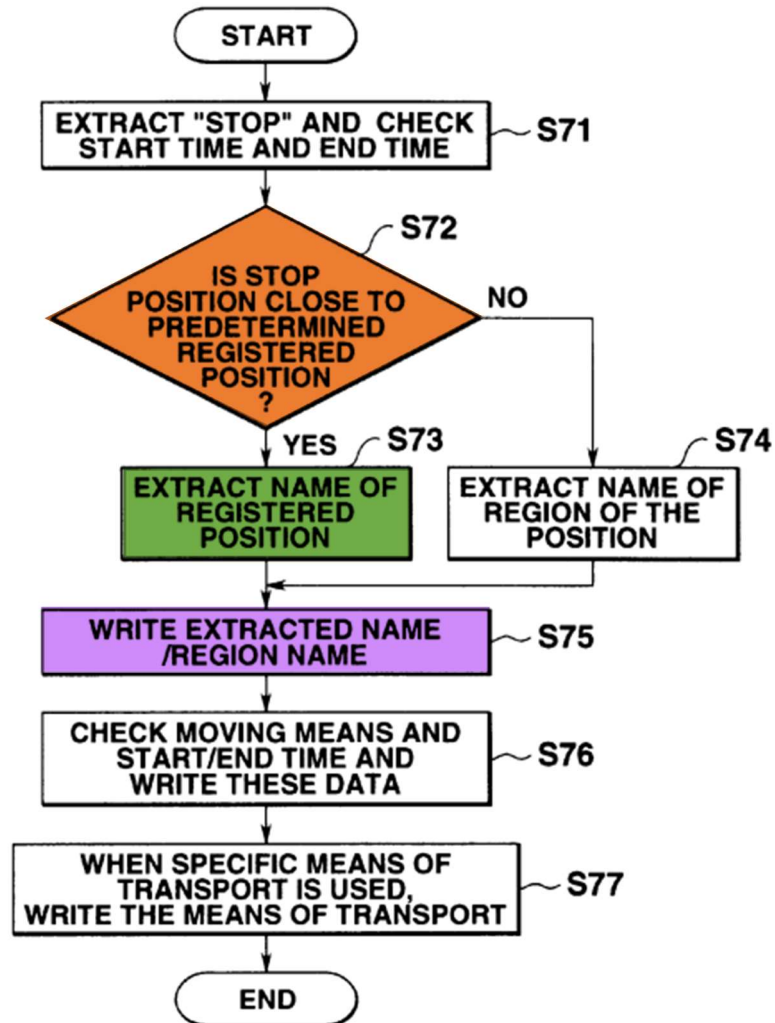
3. **Claim 22:** “The system of claim 21, wherein the mapping information is generated at a first time associated with the current position, and wherein the new mapping information is generated at a second time associated with the new position.”

As explained for claim 21, mapping information “STATION A” is associated with the user/portable terminal’s current position (x_{101}, y_{101}) and new mapping information “STATION B” is associated with a new position (x_{102}, y_{102}) of the portable terminal. Yamakita, 6:15-19 (describing the “case wherein the user who was carrying the portable terminal 1 moved from station A to station B by A railway”), FIGS. 14, 16, 18; Decl. ¶¶ 197-201.

Yamakita further discloses that mapping information corresponding to a particular position is generated at a time associated with that position because the host terminal processes the position information associated with the mapping information sequentially. Yamakita, 5:60-6:14, 8:61-64, 9:2-6, 9:15-17, FIGS. 7, 15; Decl. ¶ 198.

For example, as illustrated in Figure 10, the host terminal calculates (estimates) the user/portable terminal's "movement situation at specific time frames," e.g. "from time T_{i-1} to time T_i)" corresponding to specific positions, and "sequentially stores the estimation result data at each time (time when the position information and the like are detected by the portable terminal 1)." Yamakita, 77:39-42 (emphasis added). Then, as illustrated in Figure 15, the host terminal sequentially determines, for each estimation result, mapping information by (1) comparing, in S72, each estimation result to "[t]he table shown in FIG. 16 [which] stores various names on the map and corresponding position information" (2) extracting, in S73, the name (e.g. a railway station) corresponding to the position and (3) writing, in S75, the mapping information (railway name) into the action record table. Yamakita, 8:61-64, 9:2-6, 9:15-17.

FIG.15



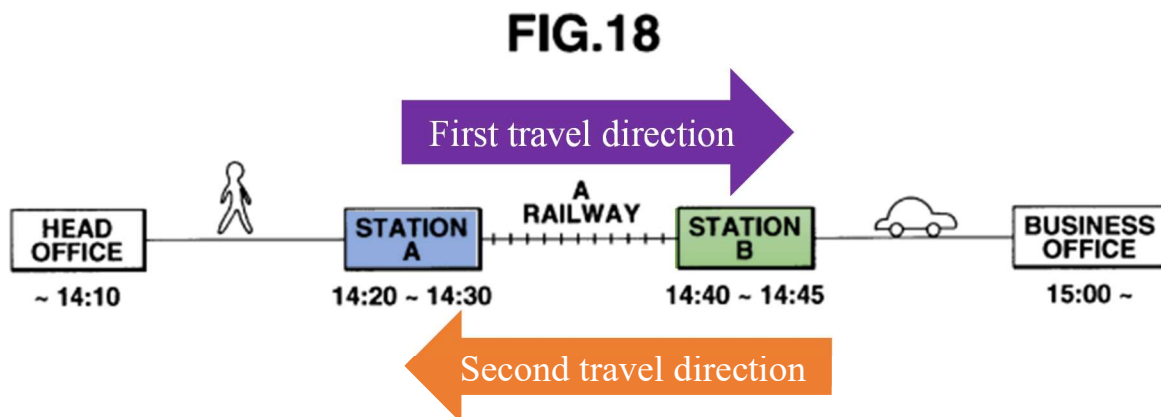
Yamakita, FIG. 15.

Thus, the host terminal generates mapping information (STATION A) corresponding to (x_{101}, y_{101}) at a first time associated with that position, and mapping information (STATION B) corresponding to (x_{102}, y_{102}) , at a second time associated with that position.

4. **Claim 23:** “The system of claim 21, wherein the mapping information comprises navigation instructions from the current position to the new position in a first direction of travel, and wherein the new mapping information comprises navigation instructions from the new position to the current position in a second direction of travel.”

As explained for claim 21, the mapping information presented in the action table reflects “STATION A” corresponding to a current position (x_{101} , y_{101}) and corresponding time (e.g., 1420), while “STATION B” corresponds to a new detected position (x_{102} , y_{102}) and corresponding time (e.g., 1440). Yamakita, FIGS. 14, 16, 18; Decl. ¶¶ 202-204.

The mapping information also provides navigation instructions from STATION A (current position) to STATION B (new position) in a first direction of travel because it tells the user how advance towards station B (i.e., to use a railway). Yamakita, FIG. 18; Decl. ¶ 203.



Yamakita, FIG. 18.

A POSITA would have understood that the new mapping information corresponding to STATION B also includes instructions from STATION B to STATION A because it tells the user, by way of illustration, that the reverse direction (i.e., second direction of travel) may be used to return to STATION A (the current position). Decl. ¶ 204.

5. Independent Claim 30

a. [30preamble]: “An apparatus, comprising:

Yamakita discloses [30preamble] because Yamakita discloses a portable terminal 1 (apparatus). Yamakita 3:3-9, FIG. 2; Decl. ¶ 205.

b. [30a]: “means for determining a current location of the apparatus;”

Petitioner proposed the following construction for this term under §112, 6th paragraph:

Function: “determining a current location of the apparatus”

Structure: “[P]rocessor 110 which processes signals from ... GPS device 115.” Ex. 1001, 1:19-25.

Yamakita discloses both the function and structure of [30a] because Yamakita’s portable terminal includes “CPU 21 [which] executes a program” that “sequentially prepare[s]” “position information ... on the basis of the output from the GPS sensor 14.” Yamakita, 3:10-12, 4:21-34, 4:37-43; Decl. ¶ 206. The CPU, like the processor of the ’416 patent is a “means for determining a current

location.” Ex. 1001, 1:19-25 (describing “processor 110 which processes signals from ... GPS device 115.”); Decl. ¶ 206.

c. [30b]: “means for displaying navigation instructions;”

Petitioner proposed the following construction for this term under §112, 6th paragraph:

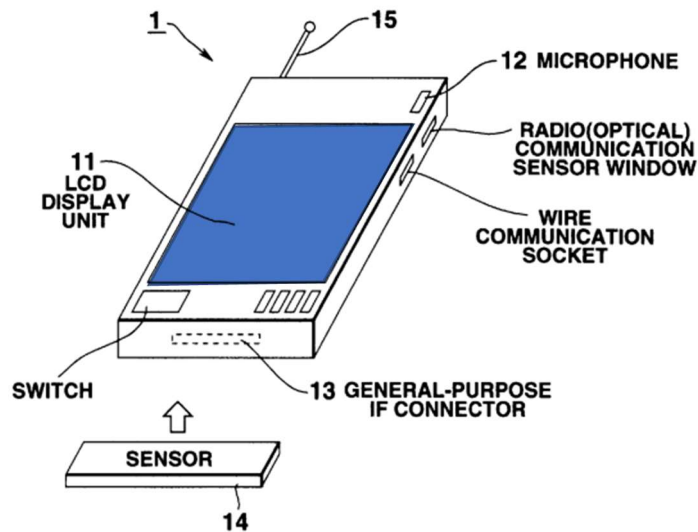
Function: “displaying navigation instructions”

Structure: A display screen 502. Ex. 1001, 3:51-53, FIG. 5.

Yamakita discloses both the function and structure of [30b] because its “portable terminal 1 has an LCD display unit 11” comprising a “liquid crystal display 31” for displaying information, including navigation information.

Yamakita, 3:3-6, 3:34-41, FIGS. 2-3; Decl. ¶¶ 207-208. When the portable terminal “extracts” navigation instructions included in an “action record table” from a data packet transferred from a host terminal/server, it “displays it on the LCD display unit 11.” Yamakita, 9:63-10:4, 11:28-31, FIGS. 14, 18 (illustrating extracted displayed navigation instructions).

FIG.2



Yamakita, FIG. 2.

The LCD, like the “display” screen 502 of the ’416 patent is a “means for displaying navigation information” Ex. 1001, 3:51-53, FIG. 5; Decl. ¶ 208.⁶

- d. **[30c]: “means for wirelessly communicating information about the current location to a remote processing device,”**

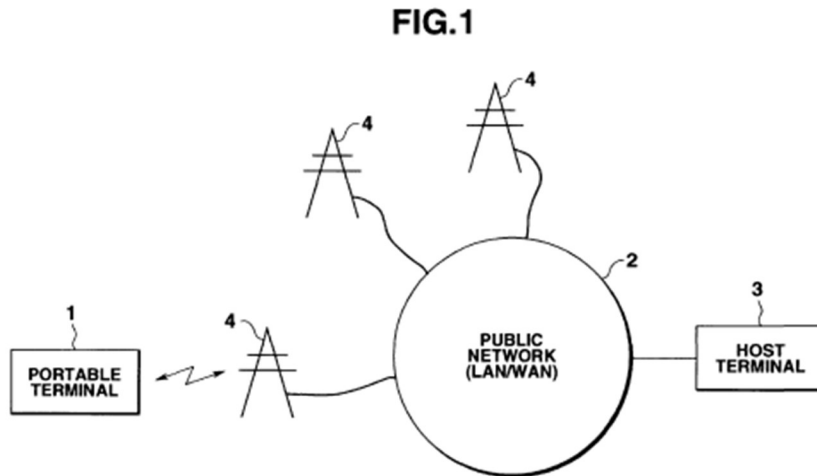
Petitioner proposed the following construction for this term under §112, 6th paragraph:

⁶ The ’416 patent does not disclose a display “for displaying navigation instructions” *per se*, but a POSITA would have understood that any display screen can display such content.

Function: “wirelessly communicating information about the current location to a remote processing device”

Structure: An “antenna” and “receivers/ transmitters” for communicating (sending and/or receiving) information. Ex. 1001, 3:48-51, 6:5-9.

Yamakita discloses both the function and structure of [30c] because Yamakita’s portable terminal 1 includes “radio communication antenna 15” and “radio transceiver 41” for wirelessly communicating the GPS determined “position of the portable terminal ... correspond[ing] to the position of the user” (current location) to a host terminal (remote processing device) via the base station. Yamakita, 3:8-9, 3:53-60, 4:21-28, FIG. 3; Decl. ¶¶ 209-210. Yamakita’s “radio transceiver 41 is connected to the radio communication antenna 15 shown in FIG. 2 to transmit/receive data to/from the base station 4” and “host terminal (server machine) 3” via a wireless “public network.” Yamakita, 2:47-52, 3:3-9, 3:53-60, FIGS. 1-2.



Yamakita, FIG. 1.

Yamakita's antenna and transceiver, like the "antenna" and "receivers/transmitters" of the '416 patent are "means" for wireless communication because they are the same or equivalent to the wireless communicating structures disclosed in the '416 patent. Ex. 1001, 3:48-51, 6:5-9; Decl. ¶ 210.

- e. **[30d]: "wherein the information about the current location comprises global positioning system (GPS) information and environmental information about the current location other than the GPS information, and wherein the environmental information comprises visual or auditory sensory input acquired by the apparatus;"**

Yamakita discloses [30d] because the information about the current location includes "pieces" of information such as current position information acquired by the portable terminal's "GPS sensor" (GPS information) and sound and image information (environmental information other than the GPS information)

corresponding to the portable terminal's current position. Yamakita, FIG. 1, Abstract, 2:54-63, 3:48-51, 4:21-34; Decl. ¶¶ 211-213.

The portable terminal uses microphone 12 to collect the “ambient sound data (e.g., noise)” and a camera to “acquire” the “image information as ambient information.” Yamakita, 4:28-30, 4:32-34, 4:55-56. The image information and noise are environmental information as described in the '416 patent. Ex. 1001, 6:11-16, claim 18 (“wherein the environmental information comprises image data captured by the camera”), claim 19 (“wherein the environmental information comprises sound data captured by the microphone”). The camera and microphone are visual or auditory sensory input, respectively, within the meaning of the '416 patent. Ex. 1001, 6:11-16 (describing a camera and microphone for receiving images and sound environmental information).

- f. **[30e]: “and means for wirelessly receiving the navigation instructions associated with the current location, wherein the navigation instructions data for plotting a course on a map including the current location of the apparatus.”**

Petitioner proposed the following construction for this term under §112, 6th paragraph:

Function: “wirelessly receiving the navigation instructions associated with the current location”

Structure: An “antenna” and “receivers/transmitters” for communicating (sending and/or receiving) information. Ex. 1001, 3:48-51, 6:5-9.

Yamakita discloses both the function and structure of [30e] because, as explained for [30c], Yamakita’s radio transceiver 41 and radio communication antenna 15 “receive data to/from the base station 4” and “host terminal (server machine) 3” via a wireless public network. Yamakita, 2:47-52, 3:3-9, 3:53-60, FIGS. 1-2 (emphasis added); Decl. ¶¶ 214-216. Yamakita’s antenna and transceiver are “means for wirelessly receiving” because they are the same or equivalent to “antenna” and “receivers/transmitters” for communicating (sending and/or receiving) information of the ’416 patent. Ex. 1001, 3:48-51, 6:5-9; Decl. ¶ 215.

The received information includes an action record table reflecting the user’s current position, route, and mode of transportation, i.e., navigation information corresponding to data for plotting a course on a map, as explained in [20g]. Yamakita, 1:41-48, 6:37-45, 9:46-48, FIGS. 7, 14.

6. Claim 31: “The apparatus of claim 30, wherein the data for plotting the course on the map is generated by the remote processing device.”

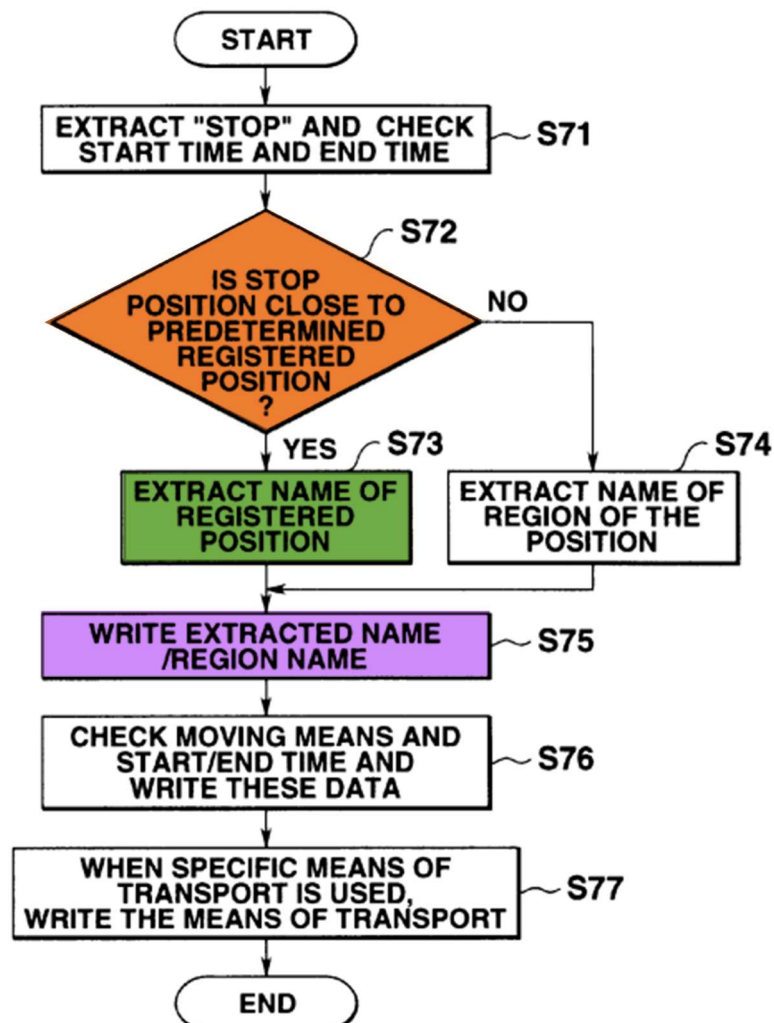
As discussed for [30e], the portable terminal receives an action record table reflecting the user’s current position, route, and mode of transportation, i.e., navigation information corresponding to data for plotting a course on a map.

Yamakita discloses claim 31 because Yamakita's host terminal (remote processing device) generates the data by calculating the user's position and movement based on the GPS and environmental information, comparing the position and movement to a table of location names and corresponding positions, extracting the names/positions corresponding to the user's positions, and writing the extracted names to the action table. Yamakita, 6:37-45 ("Upon receiving the information transferred from the portable terminal 1, the host terminal 3 executes the processing of the flow chart shown in FIG. 7 to analyze the moving route of the user who is carrying the portable terminal 1. For the purpose of analyzing the route, the host terminal 3 has map data as shown in FIG. 9."), 7:39-42, 8:61-64, 9:2-48 (explaining that "[t]he table shown in FIG. 16 stores various names on the map and corresponding position information" and the "extracted" position information is "checked" by "refer[ring]" to the table shown in Figure 16), FIGS. 7, 15; Decl. ¶¶ 217-220.

More specifically, the host terminal (remote processing device) generates the navigation information by calculating the user/portable terminal's "movement situation" at specific time frames, e.g. "from time T_{i-1} to time T_i " corresponding to specific positions, "sequentially stor[ing] the estimation result data at each time (time when the position information and the like are detected by the portable terminal 1)." Yamakita, 7:39-42. Then, as illustrated in Figure 15, the host terminal

determines for each estimation result, data for plotting a course on a map by (1) comparing, in S72, each estimation result to “[t]he table shown in FIG. 16 [which] stores various names on the map and corresponding position information” (2) extracting, in S73, the name (e.g. a railway station) corresponding to the position and (3) writing, in S75, the mapping information (railway name) into the action record table. Yamakita, 7:39-42 (emphasis added), 8:61-64, 9:2-6, 9:15-17.

FIG.15



Yamakita, FIG. 15.

7. Claim 32: “The apparatus of claim 30, further comprising means for acquiring the [G]PS information.”

Petitioner proposed the following construction for this term under § 112, 6th paragraph:

Function: “acquiring the [G]PS information”

Structure: A “GPS device” or “GPS computer.” Ex. 1001, 1:16-18, 3:17-19, 4:33-36 (describing a “GPS device” or “GPS computer” for determining a thin client’s current location).

Yamakita discloses both the function and structure of claim 32 because as discussed for [30a], the portable terminal includes a GPS sensor 14. Yamakita, 3:3-7, FIGS. 2-3. The sensor acquires “the current position by communicating with, e.g., an artificial satellite” and generates position data output, e.g., “P₀, P₁, P₂, ..., P₁₀” at times “T₀, T₁, T₂ ..., T₁₀” using the information communicated by the satellite. Yamakita, 2:54-58, 6:20-26; Decl. ¶¶ 221-222.

The GPS sensor like the “GPS device” or “GPS computer” of the ’416 patent is a “means for acquiring the [G]PS information.” Ex. 1001, 1:16-18, 3:17-19, 4:33-36 (describing a “GPS device” or “GPS computer” for determining a thin client’s current location). Decl. ¶ 222.

8. Claim 33: “The apparatus of claim 30, further comprising means for acquiring the environmental information.”

Petitioner proposed the following construction for this term under §112, 6th paragraph:

Function: “acquiring the environmental information”

Structure: A camera or microphone. Ex. 1001, 6:11-16 (describing a camera and microphone for receiving images and sound environmental information).

Yamakita discloses both the function and structure of claim 33 because as explained for [30d], the portable terminal uses microphone 12 to collect the “ambient sound data (e.g., noise)” and a camera to “acquire” the “image information as ambient information.” Yamakita, 4:28-30, 4:32-34, 4:55-56; Decl. ¶¶ 212-213. The image information and noise are environmental information as described in the ’416 patent. Ex. 1001, 6:11-16, claim 18 (“wherein the environmental information comprises image data captured by the camera”), claim 19 (“wherein the environmental information comprises sound data captured by the microphone”); Decl. ¶¶ 223-224.

Both the microphone and camera, like the “camera” and “microphone” of the ’416 patent are “means for acquiring the environmental information” because they acquire sound and image information, respectively. Ex. 1001, 6:11-16; Decl. ¶ 145.

9. **Claim 34: “The apparatus of claim 30, wherein the means for determining comprises means for determining a new location of the apparatus, wherein the means for wirelessly communicating comprises means for wirelessly communicating updated information about the new location to the remote processing device, and wherein the means for wirelessly receiving comprises means for wirelessly receiving updated navigation instructions associated with the new location.”**

As explained for [30a], [30c], and [30e], the portable terminal includes means for determining CPU), means for wirelessly communicating and means for wirelessly receiving (transceiver and antenna). Yamakita, 2:47-52, 3:3-9, 3:47-48, 3:53-60, FIGS. 1-3.

The CPU also determines whether a location is new by determining whether coordinates (locations) acquired at a particular time are different from a location acquired at an earlier time. Thus, when “the user who was carrying the movable terminal 1 was continuously present at position P_0 [at] time T_1 through time T_4 ” the processor determines that the user has not moved to a new location. Yamakita, 10:47-11:21, FIG. 17; Decl. ¶ 226.

The transceiver and antenna also constitute means for wirelessly communicating updated information about the new location to the remote processing device and means for wirelessly receiving updated navigation instructions associated with the new location because their capacity to communicate and receive information is independent of the content being

communicated. Decl. ¶ 227. This is consistent with the '416 patent, which does not identify or otherwise define communicating means based on the timing of the communication (new or otherwise). *See generally* Ex. 1001; Decl. ¶ 227.

10. Claim 35: “The apparatus of claim 34, wherein the means for displaying comprises means for displaying the navigation instructions to find the new location and for displaying the updated navigation instructions for returning to the current location.”

As explained for [30b], the apparatus includes means for displaying navigation instructions—LCD display unit 11. Yamakita, 9:63-10:4, 11:28-31, FIG. 18.

The LCD’s capacity to display the navigation information is independent of the content of that navigation information; thus, the LCD further constitutes means for displaying the navigation instructions to find the new location and for displaying the updated navigation instructions for returning to the current location. Decl. ¶¶ 228-229. This is consistent with the '416 patent, which does not identify or otherwise define displays in terms of the content being displayed. *See generally* Ex. 1001. Decl. ¶ 229.

VIII. Discretionary Denial Is Not Warranted

A. Discretionary Denial is not Warranted under § 325(d).

None of the references herein were before the Office. *See generally* Ex.1002. Petitioner submits that the first part of the *Advanced Bionics* framework

is not satisfied because the Petition includes grounds based on combinations of prior art not previously presented to the Office.

To the extent the Board determines an analysis under part 2 of *Advanced Bionics* is warranted, the asserted Grounds demonstrate that the Examiner erred in its evaluation of the prior art. Petitioner submits that the evidence and facts presented in the Petition warrant reconsideration of the prior art, and respectfully requests the Board decline to exercising its discretion to deny institution under 325(d).

B. Discretionary Denial Is Not Warranted Under *Fintiv*

Petitioner is plaintiff in the pending case captioned *BMW of North America LLC v. NorthStar Systems LLC*, No. 6:23-cv-00456 (W.D. Tex), and BMW AG, an RPI to this petition, is defendant in the pending case captioned *NorthStar Systems LLC v. Bayerische Motoren Werke AG*, No. 2:22-cv-00496 (E.D. Tex) (“the pending litigations”).

Apple Inc. v. Fintiv, Inc., IPR2020-00019, Paper 11, at 5-6 (PTAB Mar. 20, 2020) (precedential), and the Office’s interim guidelines dated June 21, 2022 (“Guidance Memo”) favor institution.

The pending litigations are in their infancy and the parties have not yet requested a stay. Trial in the Eastern District of Texas is currently scheduled for November 18, 2024. A Final Written Decision would issue around January 2025,

shortly after trial ends. Based on these facts, factors 1, 2, and 5 are, at worst, neutral. Indeed, the Board has instituted under similar fact patterns. *See NetNut Ltd. v. Bright Data Ltd.*, IPR2021-01492, Paper 12 at 9-16 (PTAB Mar. 21, 2022) (instituting IPR without stipulation and copending trial date six months before FWD); *Protect Animals with Satellites v. OnPoint Sys., LLC*, IPR2021-01483, Paper 11 at 11-13, 17 (PTAB Mar. 4, 2022) (same with trial one month before FWD); Guidance Memo, 8-9.

Factor 3 strongly favors institution because Petitioner acted diligently in filing this petition, and the parties have not substantially invested in the pending litigation. For example, discovery has not yet begun, invalidity contentions have not been served, and no *Markman* hearing occurred).

Factor 4 favors institution because invalidity contentions have not been served, and no overlapping issues exist. Factual circumstances are expected to change between the filing of this petition and a decision on institution—Petitioner intends to address these changes at the relevant time.

This Petition presents a compelling case on the merits. If the Board finds that factors 1-5 favor denial of institution, the compelling merits under factor 6 still favor institution. Guidance Memo 3-4; *CommScope Techs. LLC v. Dali Wireless, Inc.*, IPR2022-01242, Paper 23 at 3 (PTAB Feb. 27, 2023) (precedential).

IX. Mandatory Notices

A. Real Parties-in-Interest Under 37 C.F.R. § 42.8(b)(1)

The real parties-in-interest are BMW of North America, LLC and Bayerische Motoren Werke AG.

B. Related Matters Under 37 C.F.R. § 42.8(b)(2)

To the best of Petitioner's knowledge, the '416 patent is/was involved in the following district court litigations:

Name	Number	Court	Filed
<i>BMW of North America, LLC v. NorthStar Systems, LLC</i>	IPR2023-01049	PTAB	August 3, 2023
<i>BMW of North America, LLC v. NorthStar Systems LLC</i>	6:23-cv-00456	WDTX	June 16, 2023
<i>NorthStar Systems LLC v. Bayerische Motoren Werke AG</i>	2:22-cv-00496	EDTX	Dec. 27, 2022
<i>NorthStar Systems LLC v. Hyundai Motor Company et al.</i>	2:22-cv-00495	EDTX	Dec. 23, 2022
<i>NorthStar Systems LLC v. Volkswagen AG</i>	2:22-cv-00486	EDTX	Dec. 22, 2022
<i>NorthStar Systems LLC v. Mercedes-Benz Group AG</i>	2:22-cv-00323	EDTX	Aug. 19, 2022
<i>NorthStar Systems LLC v. Lenovo Group Ltd.</i>	2:22-cv-00267	EDTX	July 18, 2022
<i>NorthStar Systems LLC v. HP Inc.</i>	2:22-cv-00265	EDTX	July 15, 2022
<i>NorthStar Systems LLC v. Honda Motor Company, Ltd.</i>	2:22-cv-00143	EDTX	May 11, 2022
<i>NorthStar Systems LLC v. Broadcom Inc.</i>	2:22-cv-00144	EDTX	May 11, 2022
<i>NorthStar Systems LLC v. Xiaomi Corporation et al.</i>	2:22-cv-00139	EDTX	May 10, 2022
<i>NorthStar Systems LLC v. MediaTek Inc.</i>	2:22-cv-00135	EDTX	May 05, 2022

<i>NorthStar Systems LLC v. TCT Mobile Int'l Ltd.</i>	2:20-cv-00383	EDTX	Dec. 15, 2020
<i>NorthStar Systems LLC v. Kyocera Corp.</i>	2:20-cv-00384	EDTX	Dec. 15, 2020
<i>NorthStar Systems LLC v. Shenzhen OnePlus Science & Tech. Co., Ltd.</i>	2:20-cv-00385	EDTX	Dec. 15, 2020
<i>NorthStar Systems LLC v. ZTE Corp.</i>	2:20-cv-00386	EDTX	Dec. 15, 2020

C. Lead and Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3)

Lead Counsel	Back-Up Counsel
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D. Service Information Under 37 C.F.R. § 42.8(b)(4)

Please address correspondence to lead and back-up counsel at the addresses above and BMW-NorthStar-IPRs@finnegan.com. Petitioner consents to electronic service by e-mail.

X. Standing

Petitioner certifies that the '416 patent is available for IPR and Petitioner is not barred or estopped from requesting IPR on the grounds identified in this Petition.

XI. Conclusion

Petitioner has established a reasonable likelihood of prevailing for the challenged claims and requests the Board institute IPR and cancel each challenged claim as unpatentable.

Date: August 3, 2023

Respectfully submitted,

/Lionel M. Lavenue/

Lionel M. Lavenue

Lead Counsel

Reg. No. 46,859

CERTIFICATE OF COMPLIANCE

The undersigned hereby certifies that the foregoing **Petition for *Inter Partes* Review** contains 13,955 words, excluding those portions identified in 37 C.F.R. § 42.24(a), as measured by the word-processing system used to prepare this paper.

/Lionel M. Lavenue/
Lionel M. Lavenue
Lead Counsel
Reg. No. 46,859

CERTIFICATE OF SERVICE

The undersigned certifies that the foregoing **Petition for *Inter Partes* Review** was served on August 3, 2023, by FedEx Priority Overnight at the following address of record for the subject patent. The associated **Exhibits 1001-1005, 1007-1022** and the **Power of Attorney** were also served on August 3, 2023.

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Date: August 3, 2023

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